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# TWENTY-SEVENTH ANNUAL REPORT

OF THE

# Superintendent of Health,

OF THE

# CITY OF PROVIDENCE,

FOR THE YEAR

1909.

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FOUNDED 1636.
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MAYOR,

HENRY FLETCHER.

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*Ex-officio*

# BOARD OF HEALTH

1910.

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JOHN H. HIGGINS.

| | |
|---|---|
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| JOSEPH H. GAINER, | THIRD WARD. |
| ADOLPHUS J. EVANS, | FOURTH WARD. |
| WILLIAM K. REYNOLDS, | FIFTH WARD. |
| JOHN H. HIGGINS, | SIXTH WARD. |
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ASSISTANT REGISTRATION CLERK,

MARION A. DAY.

# REPORT.

Office of the Superintendent of Health,
March 28, 1910.

To the Honorable the City Council:

The Superintendent of Health herewith presents his report for the year ending December 31, 1909:

The population of the city was 198,635 according to the State census of 1905. It was estimated June 30, 1909, as 217,000. There were during the year 3,535 deaths, which gives a rate of 16.29 per annum per 1,000 living. This was the lowest death rate ever recorded for this city.

## NUISANCES.

Many complaints of nuisances are received at the office from citizens and some from the police. All of these receive prompt attention whether anonymous or not. Quite a number prove to be unfounded and are due to quarrels between neighbors, or between tenants and landlords. In most instances, however, real nuisances are found. During the year 977 complaints were received, of which 41 were from the police. Of these complaints 167 proved to be unfounded. 1,550 visits were made by the inspector.

### TABLE I.

NUISANCES.

| | 1907 | 1908 | 1909 |
|---|---|---|---|
| Privy vaults full and offensive | 51 | 41 | 57 |
| Cesspools full and offensive | 26 | 9 | 5 |
| Uncovered vaults and cesspools | 12 | 17 | 7 |
| Cesspools or vaults overflowing | 15 | 41 | 32 |
| Cesspools or vaults leaking into cellar | 10 | 16 | 16 |
| Defective and obstructed waste pipes and drains | 45 | 52 | 55 |
| No traps | 7 | 6 | 3 |

| | 1897 | 1898 | 1899 |
|---|---|---|---|
| Filthy lots, yards and bins | 227 | 193 | 325 |
| Filthy water in yard and street | 12 | 31 | 35 |
| Defective water closets | 101 | 60 | 79 |
| Filthy cellars | 42 | 21 | 25 |
| Filthy tenements | 1 | 3 | 8 |
| Stable manure not covered | 37 | 23 | 35 |
| Filthy dump | 11 | 9 | 18 |
| Water shut off from water closets | 18 | 16 | 10 |
| Garbage barrels uncovered, unprovided, etc. | 12 | 12 | 47 |
| Bad odors, etc | 4 | 7 | 17 |
| Miscellaneous | 18 | 16 | 36 |

Five orders under form A, to abate nuisances, were issued by the Board of Aldermen, 4 under form C to vacate premises, and 2 under form E to connect with the sewer. There were also issued 17 preliminary notices to connect with the sewer.

Twice during the year the department was confronted by the problem of extinguishing a burning dump. When the combustible material gets on fire underneath the ashes of a dump, most offensive odors arise. As the fire smoulders under many feet of filling, and is often under many thousands of feet of surface, the nuisance becomes a serious one. In both the cases above referred to the owner was ordered to abate the nuisance and asked the city to do it for him at his expense. On another occasion a similar fire was extinguished by driving down 1¼ inch pipes and putting on the city water, but the operation was a long one. In both cases in 1909 the bank was washed away with a hose as in hydraulic mining. The result of driving pipes in one instance resulted in an explosion which threw many tons of earth into the air. The cost of extinguishing the dump at the corner of Admiral and Berkshire streets was $267.48 and of the one on Oxford Street $145.43.

### FLIES AND MOSQUITOES.

Some years ago Professor Gorham and myself made a study of the species of mosquitoes found in Providence, and of their breeding places. Occasional observations have since been made from time to time, and a few experiments have been undertaken to prevent their breeding in catch basins. During last summer Mr. G. F. Sykes, who was assisting the Sanitary Inspector, devoted a part of his time to the study of the distribution and breeding places of flies and mosquitoes. Flies have of late been accused of being important carriers of disease, and Mr. Sykes attempted to find where they breed, and where they are found in Providence, and also to determine whether they really have any relation to the causation of certain diseases as they occur in this city. His reports which follow contain much that is of interest and value. There is nothing to show that flies are much of a factor in the spread of either typhoid fever or summer diarrhea, and it is encouraging to learn that by ordinary cleanliness and a little care in removal of stable manure their numbers can be very greatly reduced. It was hoped that sulphate of copper might prove a cheap and efficient destroyer of mosquitoes in catch basins, but its application was not as successful as was expected.

## Mr. Sykes' Report on Flies.

### THE DISTRIBUTION OF FLIES IN PROVIDENCE.

"During the summer of 1909 a series of investigations was begun in Providence for the purpose of ascertaining the importance of the "house-fly" in the spread of enteric diseases. The results of the first season's observations are various and interesting, inasmuch as certain popular conclusions in regard to the fly nuisance seem to be no longer tenable.

The plan of operations involved (1) the determination of the seasonal and geographical distribution of the pestiferous flies over the city; (2) the seasonal and geographical distribution of typhoid fever and diarrhea; (3) the relation of the fly distribution by means of plotted curves and maps to the distribution of enteric diseases; (4) the effect of meteorological influences, especially temperature and sunshine upon both flies and disease distribution.

During the month of June, nineteen wire, balloon-shaped fly traps were set in localities of varying degrees of cleanliness. In selecting the centers of observation the main idea was to get reports from localities which were representative of the different sanitary conditions of the city. Hence, the east side represented one center of observation, the business section another, Federal Hill district another, Richmond Street vicinity another, and the open west side of the city still another. The individual traps were located in back yards in proximity to the swill barrel or ash bin, in livery stables, in restaurant kitchens, and in offices. The traps were visited once in every period of forty-eight or seventy-two hours, since at the end of this time the bait, which consisted of a mixture of black molasses and maple syrup, would usually be exhausted. The flies were killed by placing trap and all in a paper bag containing a piece of cotton saturated with chloroform. Then they were either counted on the premises, or carried back to the laboratory for enumeration. Daily and weekly records were kept throughout the season, and at the end of the summer curves were plotted on the basis of the weekly counts, to show the results both for the individual traps, and for the total catch of the season.

The following is a description of the individual stations:

Station I. This station was situated in the back yard of a dwelling house at the corner of Richmond and South streets. The trap was placed upon the roof of a hatch about five feet from the ground and on the northern aspect of the house. In the yard was an open swill tub and an ashbin containing more or less fermentable matter; and abutting the yard was a meat market. The record catch for a single day was made at this station, when 1,000 flies were taken; and the highest weekly catch for the same, about 3,000, was exceeded only by one other station, No. II, in the Italian district. There were no stables in the immediate vicinity to furnish breeding places, but an examination of the contents of the ash bin showed that flesh flies were breeding there in considerable numbers. Thus, we may conclude that the flies were both bred on the premises and were attracted to the same by the opportunities of obtaining food.

Station II, 95 Gesler Street. This station was located in a back yard, but in the Italian district. The trap was placed upon a low roof in the open. The yard itself was kept fairly clean, but there were two stables adjoining where the manure was kept in the cellar. Larvae of *Musca domestica* were found here in large numbers, but of no other species, and yet only half of the flies caught at this station were *Musca domestica*. However, in close proximity to this station were several ash bins which were used almost exclusively as receptacles for swill. Hence, the origin of many of the blow flies and sarcophagids which were caught here may be reasonably explained.

Station III, 116 Cedar Street, was also in the Italian district, but a quarter of a mile to the northeast of Station II. The trap was placed on a window shelf on the southern aspect, and shut in by two small buildings where horses were kept. The manure from these stables was kept in barrels and was removed frequently. No larvæ were ever found in it, but in the ash bin which was almost under the window larvæ were found in great numbers the greater part of the summer. On the 30th of August the ash bin was cleaned out, and within five days the number of flies taken at that station dropped from 850 to 41. The meaning of this is obvious.

In contrast to these three stations were three others (IV, V, and VII) situated on the east side. The traps were all located in back yards and near the swill barrel, and all were situated on the northern aspect of the house. The catches for these traps hung close to the zero line for the greater part of the summer, and only five times did the total weekly number exceed 100 at Station V, while at Stations IV and VI that number was reached only three times. Moreover, these exceptions seem to admit of explanation on the ground of sudden change in weather, temperature or change in the immediate environment. For example, at Station IV, 86 Humboldt Avenue, the swill barrel sprang a leak, and in the course of a week the fly catch rose from 9 to 117. This is clearly a case of attraction. The only known place in the immediate vicinity where the flies could breed were several open privies which were used by carpenters at work near by. Besides, the flies were almost entirely blow-flies. The report for Station VI, 140 Pitman Street, shows a sudden jump from 4 to 791 during the week of August 21st. The most probable explanation of this sudden fluctuation is that the flies came from a dump not three hundred yards distant where refuse from a fish market had been thrown at about that time.

From the above differences in fly catch it seems clear that wherever filth is allowed to collect there are sure to be flies; and where there are flies a breeding place is sure to be nearby.

To ascertain the contrast between the distribution of flies out-of-doors and indoors, several stations were selected where traps were set both out and indoors. For instance, at Station VII the out-of-door trap was placed on a hatch on the northern aspect of the house. The yard was bordered on the one hand by a stable with a cellar containing manure, on the other hand by an open field. The premises, when the trap was set, were in rather filthy condition, and the catch for the first month averaged about 1,200 flies per week, while the catch for the inside trap which was placed in the kitchen averaged 20 flies per week. During the next month the average rose to 112 for the inside trap; afterwards it fell off to rise again during the month of October to 71 per week. Towards the last of July conditions outside were modified in several respects so that the catch during the rest of the summer could not be relied upon. However, several points may be of interest in this connection. The landlord took great pains with the appearance of the premises on learning of the presence of an officer of the Health Department; and, furthermore, the open field was cleaned up and turned into a children's playground. Thus it may reasonably be concluded that the diminution in the number of flies taken at this station may have been due in some measure to these changed conditions.

At Station VIII, which was located at the corner of Bond and Atwells Avenue, traps were set both out and indoors. Trap (a) was placed in the kitchen of an Italian restaurant. Hundreds of flies were caught here daily. The record weekly catch for this trap occurred in the third week of July when 1,775 flies were taken. The number diminished during August and September, but rose again in the end week of October to 1595.

Trap (b) was situated on the southern aspect of the house on top of a hatch, the roof of which was covered with tin. This trap was just outside of the kitchen window, and although there were numbers of flies about they would not enter the trap until later in the autumn. The explanation of this phenomenon was not clear. However, for the month of October the average number of flies caught was 214, while that of (a) was 727. Trap (c) was set in the yard adjoining, on a hatch facing westward. The average catch for this trap for the same period was 394.

Station IX, located in the business section of the city, shows interesting though meagre results as compared with VII and VIII. The trap was placed in the kitchen of a second floor restaurant, and whereas hundreds of flies were caught daily at VIII, only 343 were taken at this station during the twelve weeks of its exposure.

Station X, the anatomical laboratory of Brown University shows a scarcity of flies in spite of the fact that numbers of flies brought in for examinatioin revived and escaped before they could be destroyed.

Station XI, at the City Hall, shows week after week of zero reports. Only once during the season did the catch exceed one dozen; and that exception is accounted for by the fact that these flies had been accidentally liberated in the room.

Stations XII and XIII, represent conditions at two livery stables, the one on the east side, Aldrich's, the other in the business center, Billings's. Both traps were set in carriage rooms which opened in each case directly from the street and into the horse stable. But in neither case were many flies caught. This was obviously due to the fact that pains were taken by the proprietors to have the manure removed (especially in the case of the downtown stable) at least once a week. At the east side stable the manure was shut away from the flies in a tight vault. Toward the latter part of the season, however, the vault was left open and thousands of larvae were observed shortly in the manure. During the third week of October numerous tiny flies were taken at Station XIII, closely resembling the fruit fly, *Drosophila.*

Station XIV, in the Italian district, nearly opposite VIII, and situated in the office of the *Rhode Island Echo* shows an interesting contrast to the others in the vicinity. The trap was placed on a window sill of the second story; the window was alternately opened and closed throughout the season. Very few flies were caught here, never more than fifteen during a week; but a greater variety was found here than at any other indoor station. For example: on the 30th of September 3 *Musca domestica* and 1 *Sarcophagid* were found; and on the 4th of October 2 *Musca domestica* and 1 *Homalomyia* were taken. On several other occasions also *Homalomyia* were caught at this station. At the other indoor stations the only flies caught other than *Musca domestica* were *Lucilia caesar.* In contrast with this at Station VII 585 flies were caught between June 21st and September 21st. Of these 584 were *Musca domestica,* and 1 was *Lucilia caesar.* At Station VIII (indoors) 15,530 flies were caught during the season, and of these 15,527 were *Musca domestica,* while the other three were *Lucilia caesar.* Thus it will be seen that over 99 per cent of the flies caught in these two kitchens were *Musca domestica.*

Station XV, 53 Vernon Street. The report for this station shows an interesting comparison between two adjoining localities whose sanitary conditions were very different. For, although Station XV is scarcely a quarter of a mile from Station II, the average weekly catch for the season was less than five flies, while the same for II approached 2,000. This is another instance showing that the fly nuisance is local.

Station XVI was located in the western part of the city where the population is scattered, and the sanitary conditions are good. This trap was placed on a shelf in the southern aspect of the house. The data obtained from this station are rather meagre, but are sufficient to show that there were not many flies in the locality, for the weekly record shows several zeros, while the highest catch for any week was fourteen flies. This catch was made during the third week of August, and no more flies were caught during the remainder of the season, although the trap was cared for in the usual manner for several weeks.

From the first an attempt was made to identify all the species of flies found. The result was that seven species were determined with tolerable degree of certainty, while several undetermined species were found. The following is a list:

*Musca domestica,*
*Muscina stabulans,*
*Calliphora erythrocephala,*
*Stomoxys calcitrans,*
*Scenopinus fenistralis,*
*Homalomyia canicularis,*
*Lucilia caesar,*
*Sarcophaga saracina,*
*Drosophila* ———

The identification was made according to Williston's classifications, with reference to L. O. Howard's descriptions.

A comparison of the out-of-door with the indoor catches shows the following results:

Station VII a (indoors) from June 21st-Sept 21st:

| | |
|---|---|
| *Musca domestica* | 584 |
| *Lucilia caesar* | 1 |
| | 585 |

Station VII b (outdoors):

| | |
|---|---|
| *Musca domestica* | 2,883 |
| *Muscina stabulans* | 331 |
| *Calliphora erythrocephala* | 288 |
| *Lucilia caesar* | 461 |
| *Homolomyia canicularis* | 305 |
| *Sarcophaga saracina* | 62 |
| Miscellaneous | 128 |
| Total | 4,458 |

From this it will be seen that *Musca domestica* are by far the most numerous of all the species to be found, both in and out of doors.

At the end of the season charts were made to show by plotted curves (1) the seasonal distribution of flies in the city on the basis of weekly catches, (2) monthly total catch (a) out-of-doors, (b) indoors, and (3) the monthly total catch out and in.

Other curves were plotted to show (1) the seasonal distribution of typhoid cases which developed in the city between June 1st and November 1st.

(2) the seasonal distribution of deaths from diarrhea, and still another curve was plotted to show the seasonal variation of temperature.

The results of the season's investigations are in short as follows:

(1) The fly nuisance is local;

(2) The geographical distribution of flies is determined by local unsanitary conditions;

(3) The seasonal distribution is conditioned by meteriological influences; temperature and sunshine;

(4) Over 99 per cent of all the flies caught (in three kitchens) were *musca domestica;* the remaining fractional per cent were *Lucilia caesar;*

(5) The plotted curve for typhoid cases did not show a close relation to the fly curve, but it did show closer parallelism to the temperature curve;

(6) The high water mark for deaths from diarrhea antedated the height of the fly season by fully three weeks, and followed from one to two weeks after a noticeable rise in temperature;

(7) The geographical distribution of typhoid cases in the city was largely independent of "unsanitary" and "fly-centres" areas.

The conclusions drawn from the above, points toward a more fundamental factor than the house fly in the spread of enteric diseases. Furthermore, judging from the constant relationship which the temperature curve maintained to all three of the other curves, fly, typhoid, and diarrhea, one might naturally conclude that therein lay a valuable clue to the solution of the problem; but whether the influence of temperature is real or only apparent, direct or indirect, remains yet to be determined.

## MR. SYKES' REPORT ON MOSQUITOES.

### THE CONTROL OF MOSQUITOES IN PROVIDENCE.

Anyone who is acquainted with the habits and life-history of mosquitoes, knows that they breed only in water, and that the larvae feed only on microscopic forms which are found in it. Consequently, it may be reasonably argued that if the breeding places could be removed, or the possibility of the larvae taking food could be prevented, there need be no mosquitoes in any community. However, inasmuch as the former proposition is practically impossible, since there *must* needs be water accessible under the present sewage system, the only course left is to put the second proposition to the test. And it was with this purpose in view that investigations were undertaken during the spring and summer of 1909.

The problems with regard to the mosquitoes which were suggested to me for solution, together with the information which I obtained during the past season are given below.

### IDENTIFICATION AND DISTRIBUTION.

I. Do the mosquitoes which infest the city of Providence belong to one, or to several species?

During the summer at least three different genera and seven different species were found within the city limits. They are as follows:

*Culex pipiens,* the common "rain-barrel" mosquito.
*Culex canadensis,* the "woodland pool" mosquito.
*Culex cantans,* the "brown, woods" mosquito.
*Culex salinarius,* the "unbanded salt marsh" mosquito.
*Culex solicitans,* the "white-banded salt marsh" mosquito.
*Corethrella brákeleyi,* the "short-billed" mosquito.
*Anopheles punctipennis,* a non-malarial mosquito.

In former years other species were observed by Dr. Chapin and Prof. Gorham, including the malarial mosquito *Anopheles maculipennis.*

II. What is their geographical distribution?

The first, the "rain-barrel" mosquito, is both widely and abundantly distributed in the city; and it is the one which produces such widespread discomfort during the summer months. The second and the third are found for the most part in the wooded area in the northeastern part of the city. *Salinarius* was found in large numbers in the salt marshes north of Thurber avenue, while *Solicitans* was found in the vicinity of Field's Point. Only a few specimens of the harmless short-billed genus were found in Roger Williams Park. *Punctipennis,* the only species of *Anopheles* found, was pretty widely distributed, although not very abundantly.

III. What is the seasonal distribution?

Adult mosquitoes made their first appearance at different places in the city in the following order:

1st week of June,
  Pitman and Butler Avenues,
  Blackstone Park,
  37 Creighton Street,
  Manton.

2nd week,
  North Burial Grounds,
  29 Taber avenue,
  Camp Street,
  669 Branch avenue,
  North end of Arlington Avenue.

3rd week,
  90 Elmgrove Avenue,
  6 Villa Avenue.

4th week,
  84 Keene Street,
  51 Vernon Street.

From the fourth of July the mosquitoes were continuous at 84 Keene Street, but they were in abundance only after the ninth. During the first week they became very troublesome on Pembroke Avenue, and by the thirteenth they were uncomfortably noticeable at Carpenter and Battey streets.

### BREEDING PLACES.

IV. Where do the mosquitoes breed?

Larvae were to be found in practically every pool of stagnant water on the outskirts of the city as early as the 17th of April. Many of these pools dried up by the middle of June. Permanent breeding places, however. were located in the following sections:

Near Pitman and Butler Avenues, on the grounds of Butler Asylum, in the North Burial Grounds, in the Swan Point Cemetery, in the Wanskuck Meadows, south of Reservoir Avenue, in and near Roger Williams Park, west of Field's Point, north of Thurber avenue, in Davis Park, in the dump south of Davis Park, and on the premises of the Brown & Sharpe Manufacturing Co.

The mosquitoes leave their early haunts as the hot weather approaches and the pools dry up, and migrate towards the center of the city, utilizing the street catch-basins for breeding purposes.

V. When do the larvae first appear in the catch-basins?

On the 8th of July the first larvae were taken from a catch-basin on the north side of Keene Street, near No. 76. The following day larvae were found at Thayer and Cushing, Thayer and Lloyd, 106 Lloyd, 92 Keene, and 48 Barnes. In every case the larvae were found on the north side of the street where the sun's rays could strike in during the heat of the day. Not until the 29th of July were any larvae found on the south side of the streets in this vicinity. And even at Brown and Keene (N. W.) where the ground was only a little higher and the surface of the water a little farther from the curb, larvae were not found until this time. On the thirteenth of the month, however, numerous larvae were found in basins at Carpenter and Battey, both north and south; also at Carpenter and Ringgold, and Cottage and Lemon, north. On Belknap Street there are no catch-basins, and few, if any, mosquitoes had been observed there at that time, indicating that the nuisance is largely local

### METHODS OF CONTROL.

VI. How can the mosquitoes be kept from breeding in the catch-basins?

Mosquitoes may be eliminated by 1, destroying their breeding places by drainage; 2, covering the water with a film of oil to exclude air; 3, applying a poison to the water; 4, destroying the vegetable life on which they feed. The use of oil in catch-basins has proved to be rather expensive, and cheaper methods of prevention were sought.

The following results were obtained:

(1) Copper sulphate applied in quantities of from one to four ounces reduces the number of larvae breeding in the catch-basins, even after the basins have become infested.

(2) Heavy precipitation washes out the larvae and renders the chemical ineffective.

(3) An average of seven applications was made between the 9th of July and the 16th of September.

(4) An average of two and a third ounces of the chemical was applied to each catch-basin.

(5) At ten cents per pound the average cost per basin was $0.10½ for the season, or $0.3 2-3 per application.

(6) Chloride of lime did not prove effective in reducing the possibility of larvae breeding in the catch-basins, even when used in quantities as great as one-half pound.

(7) Quicklime proved ineffective as a lavicide; as a deterrent its efficiency was not determined.

(8) The test with ammonium bichromate was not conclusive; but when used in quantities varying from 1 to 2 oz., the results were not satisfactory; besides, it is more expensive than copper sulphate.

In conclusion, it may be suggested that with a little more attention to the open breeding pools, and a judicious application of copper sulphate throughout the whole or any one section of the city, the numbers of infesting mosquitoes could be materially reduced, and at a comparatively small cost.

### GARBAGE.

During the year the "swill and house offal" was collected by Messrs. A. H. & J. Barney at the rate of $2,299.17 per month. This makes the annual payments $27,590.04. The contractors use 24 two-horse wagons. It is not known how much garbage is collected. It may be anywhere from 16,000 to 20,000 tons per annum. The work has been done in a very satisfactory manner. Only 200 complaints were received during the year, a remarkably small number for a city of the size of this.

A small amount of garbage is collected from hotels and restaurants by farmers who receive a special license for this. There are also a considerable number of farmers who purchase swill from the contractors and draw it out into the country to feed to swine. Each person is required to have a license for this. In all 97 of these licenses were issued during 1909. The licenses run from April 1st to April 1st. Since these farmers have been required to have water-tight steel wagons little trouble from them has been experienced.

### DEAD ANIMALS.

Two parties are now licensed under the rules adopted July 2, 1908, to remove dead animals. They are Theodore S. Barnes and N. Roy & Son.

The contractors are obliged to report weekly to this office the number of dead animals and the amount of condemned meat removed. The following table shows the number of animals removed since the first contract was signed in 1903:

## TABLE II.

| | Horses. | Cattle. | Other Animals. | Total. |
|---|---|---|---|---|
| 1903.<br>Six Months. | 327 | 11 | 2 | 340 |
| 1904. | 694 | 16 | 3 | 713 |
| 1905. | 593 | 15 | .......... | 608 |
| 1906. | 654 | 55 | 5 | 714 |
| 1907. | 755 | 16 | 2 | 773 |
| 1908. | 792 | 15 | 5 | 812 |
| 1909. | | | | |
| January | 42 | .......... | .......... | 42 |
| February | 31 | 1 | .......... | 32 |
| March | 29 | 1 | .......... | 30 |
| April | 24 | .......... | .......... | 24 |
| May | 33 | .......... | .......... | 33 |
| June | 26 | .......... | .......... | 26 |
| July | 27 | 1 | .......... | 28 |
| August | 35 | 1 | .......... | 36 |
| September | 40 | .......... | .......... | 40 |
| October | 41 | .......... | .......... | 41 |
| November | 41 | 1 | 1 | 43 |
| December | 51 | .......... | .......... | 51 |
| Total | 420 | 5 | 1 | 426 |
| Grand Total | 4,235 | 133 | 18 | 4,386 |

## NIGHT SOIL.

In accordance with the statute and rules of 1892, licenses are issued to engage in the business of removing the contents of privy vaults and cesspools. These licenses run from April 1st to April 1st. The fee for the license is $1. The following are the numbers issued:

| | | | | | |
|---|---|---|---|---|---|
| 1892 | 32 | 1898 | 24 | 1904 | 20 |
| 1893 | 28 | 1899 | 25 | 1905 | 19 |
| 1894 | 22 | 1900 | 21 | 1906 | 17 |
| 1895 | 23 | 1901 | 20 | 1907 | 18 |
| 1896 | 26 | 1902 | 20 | 1908 | 18 |
| 1897 | 29 | 1903 | 19 | 1909 | 15 |

## INSPECTION OF PROVISIONS.

The office of inspector of provisions was made a permanent one in 1892, and the appointment continued to be made by the board of aldermen in accordance with an act passed March 5, 1858. Pursuant to a resolution of the city council the city solicitor applied to the General Assembly for a change in the law so that now the inspector of provisions is appointed by the superintendent of health.

## PUBLIC LAWS OF 1909.

### CHAPTER 470.

[Passed April 16, 1909.]

*It is enacted by the General Assembly as follows:*

SECTION 1. The superintendent of health of the city of Providence, instead of the board of aldermen thereof, is hereby authorized and empowered to appoint annually in the month of January an inspector of provisions, who shall hold office until his successor is appointed and qualified, and shall have all the powers and duties specified in Section 1 of the act entitled "An act in amendment of and in addition to Title XIV, Chapter 74, of the Revised Statutes, 'Of regulations for the prevention of infectious and contagious diseases,'" passed March 5, 1858, and in the ordinances of said city and rules and regulations of said board of aldermen, now or hereafter passed, relative to the inspection, seizure, forfeiture, and destruction of decayed, diseased, or unwholesome meat, fish, vegetables, fruit, or other provisions.

SEC. 2. This act shall take effect on and after the first day of January, A. D. 1910.

The following is the report of the inspector for the year 1909:

DR. CHARLES V. CHAPIN, *Superintendent of Health:*

DEAR SIR: I submit my report for the year 1909 as Inspector of Provisions, also as Inspector of Beef and Pork. I desire to incorporate as a part of this report the same suggestions and recommendations made by me in my report for the year 1908, as I have found the same conditions to exist during the year 1909, which I referred to as existing during the preceding year. Therefore, I can do no better than to quote from my report of the year 1908:

"I have noticed during the past year, beef conveyed through the streets of Providence, in wagons and trucks which were uncovered. I regard this as improper and should be prohibited. All beef and poultry should be covered while it is being carried from one place to another, and the wagons used in conveying said beef and poultry should be clean and sanitary.

"There is also a very bad practice existing in Providence among the marketmen of displaying beef and fresh pork on the outside of stores, where the dust and dirt can be blown upon them. Marketmen should be prohibited from displaying vegetables nearer the floor than two feet.

"Dealers in candy and sticky fruit such as dates and figs, when their goods are displayed on the sidewalk should be compelled to keep said goods under glass covering that would be dust proof.

"Complaints of old newspapers having been used for wrapping beef and fish have been often received, but I have no authority in the premises.

"I very often observe that the benches and blocks of many markets are not cleaned, and refrigerators are not cleaned or properly ventilated.

"As the Inspector of Provisions has no power to enforce cleanliness in markets I recommend that such power be given him.

"I respectfully again recommend that ordinances be enacted covering the subjects referred to, and giving the Inspector of Provisions the necessary power to enforce them. I also strongly recommend that the city of Providence should take the initiative in the passage of a law by the legislature requiring an inspection at the time of slaughter of all animals killed within the State for the purpose of food, there is at present no law covering the inspection of cattle at the time of slaughter."

The following is a summary of the work performed:

| WARDS. | STORES. | VISITS. |
|---|---|---|
| 1 | 67 | 1,160 |
| 2 | 30 | 221 |
| 3 | 105 | 1,260 |
| 4 | 97 | 1.874 |
| 5 | 49 | 380 |
| 6 | 41 | 375 |
| 7 | 46 | 467 |
| 8 | 50 | 593 |
| 9 | 109 | 986 |
| 10 | 51 | 420 |
| | 645 | 7,736 |

In addition there have been made 920 inspections of meat, fish, produce, peddlers' wagons, and thirty-three complaints attended to.

The following is a list of goods condemned:

| | |
|---|---|
| Beef | 3,843 lbs. |
| Corned Beef | 200 " |
| Veal | 4,608 " |
| Lamb and Mutton | 175 " |
| Chickens and Fowls | 180 " |
| Turkeys | 1,920 " |

| | |
|---|---|
| Sausage | 38 lbs. |
| Liver | 452 " |
| Pork | 150 " |
| Fish | 450 " |
| Lobsters | 150 " |
| Pigs Plucks | 100 " |
| Ox Tails | 25 " |
| Corned Shoulders | 125 " |
| | 12,416 " |

### VEGETABLES AND FRUIT.

| | | | |
|---|---|---|---|
| Beans | 32 bu. | Peaches | 55 baskets. |
| Kale | 42 bbl. | Berries | 1,680 quarts. |
| Spinach | 7 " | Cabbage | 980 lbs. |
| Potatoes (frozen) | 510 bu. | Pineapples | 5 crates. |
| Lettuce | 6 boxes. | | |

| | |
|---|---|
| Total number of pounds of provisions | 12,416 |
| Total number of bushels of vegetables | 1,044 |

Respectfully submitted,

WILLIAM J. BEANE,
*Inspector of Provisions.*

### BOARDING HOUSES FOR INFANTS.

These boarding houses are required to take out licenses annually, by Chapter 464 of the Public Laws (May 20, 1897). They must also be inspected annually by this department. Six licenses were issued in 1909 authorizing the receiving of 16 children. The largest number in any one house was four.

Since July, 1908, the Providence District Nursing Association has voluntarily undertaken a supervision of these houses. At present only 5 children are being boarded in six houses.

### LODGING HOUSES.

The Act to Regulate Lodging Houses in this city was passed March 28, 1902, and the Regulations authorized by it were adopted by your board July 17, 1902.

At present the following places are licensed:

| | |
|---|---|
| Joseph P. Fallon | 1 North Main St. |
| Minnie Woleon | 14 North Main St. |
| Samuel Licker | 193 Richmond St. |

## MEDICAL INSPECTION OF SCHOOLS.

The inspection of schools has continued during the year on about the same lines on which it was inaugurated in the spring of 1904.

Since March 1, 1909, three inspectors have been employed, and on April 1 the inspection was extended to the parochial schools. This was done at the urgent request of a number of the teachers in these schools, and with the sanction of the Bishop. On Feb. 8, 1909, a nurse was employed to follow up the cases in their homes and show the mothers how to apply simple remedies as ordered by the inspectors. The nurse also has much to do in taking children to the oculist, and to the hospital. The nurse now receives $70 per month during the school year.

During the remainder of the school year the nurse saw 2,800 children in their homes, and about 3,000 children in school. 4,200 were examined for pediculosis, of whom 920 were found to have lice and were cleansed under the direction of the nurse. 200* cases of scabies received the attention of the nurse. Often a case of scabies would be the means of discovering several more in the family 130 cases of eye trouble were seen, 116 of affections of the ear, and 270 cases of adenoids, of which 200 were operated upon. 187 other cases received advice and assistance from the nurse. The following are examples of such miscellaneous work.

"In one home where the children were reported absent from school on account of sickness, the father of a family of six was having a pulmonary hemorrhage; the children were too frightened to move, the mother was out trying to earn enough to support the family. A doctor was quickly obtained, the patient made as comfortable as possible, and the hungry children supplied with food and clothing from the

---

When the nurse visits a school child with scabies she usually finds others in the family with the same trouble.

Society for Organizing Charities. These children had lived for a week on bread and water.

In another home the mother had left her family and disappeared. The father was sick in bed, the house filthy, dirty, and unsanitary, the children running wild, engaging in all sorts of immoral conduct. The sick father was sent to a hospital and the children to a Home."

An oculist also was appointed in 1906. The salary of each inspector and of the oculist is $500 per annum. Besides the examination of the eyes a great part of the work of the school inspectors relates to pediculosis and contagious skin affections. It has been found best for the inspectors to treat many of these cases, and the small amount of material used for this purpose is furnished by the department.

The treatment of scabies and ringworm by the department, the advice to eye cases given by our oculist, and the sending of so many cases of adenoids and other affections to the hospitals, has met with the disapproval of many physicians. Their views were set forth in the report of a committee presented at the December meeting of the Providence Medical Association, a copy of which was sent to me. I am intending during the coming year to try to carry on the work of school inspection more nearly along the lines indicated by the above mentioned report.

The work of the inspectors as shown below is tabulated for the school year, the period covered by the table being the year 1908-9:

### TABLE III.

### MEDICAL INSPECTION OF SCHOOLS, 1908-1909.

*Diseases found and work accomplished.*

I. SPECIFIC INFECTIOUS DISEASES.

| | |
|---|---|
| Chickenpox | 11 |
| Diphtheria | 13 |
| German Measles | 15 |
| Influenza | 8 |
| Malaria | 7 |
| Measles | 11 |
| Mumps | 31 |
| Pneumonia | 3 |
| Scarlet Fever | 7 |
| Syphilis | 1 |
| Tuberculosis | 11 |
| Whooping Cough | 3 |
| | 121 |

## II. DISEASES OF THE ORAL AND RESPIRATORY TRACT.

### *1. Mouth.*

| | |
|---|---|
| Alveolar Abscess | 3 |
| Cleft Palate | 5 |
| Dental Caries | 162 |
| Gingivitis | 2 |
| Hair Lip | 1 |
| Stomatitis | 4 |
| | 177 |

### *2. Pharynx.*

| | |
|---|---|
| Acute Pharyngitis | 2 |
| Chronic Pharyngitis | 2 |
| Hypertrophic Pharyngitis, Chronic | 3 |
| Sore Throat | 116 |
| | 123 |

### *3. Tonsils.*

| | |
|---|---|
| Acute Follicular Tonsillitis | 20 |
| Chronic Tonsillitis | 14 |
| Hypertrophied Tonsils and Adenoids | 223 |
| Tumor Posterior to Tonsil | 1 |
| | 258 |

### *4. Nose.*

| | |
|---|---|
| Acute Coryza | 32 |
| Epistaxis | 6 |
| Nasal Obstruction | 25 |
| Polypus | 2 |
| Rhinitis, Chronic | 5 |
| Septum, Deviated | 2 |
| | 72 |

### *5. Naso-Pharynx.*

| | |
|---|---|
| Adenoid Diseases | 263 |
| Naso-pharnyngitis (Post-nasal Catarrh) | 33 |
| Uvula, Bifid | 1 |
| Uvula, Elongated | 2 |
| | 299 |

### *6. Larnyx.*

| | |
|---|---|
| Acute Laryngitis | 4 |
| Hoarseness (no apparent cause) | 8 |
| | 12 |

### *7. Bronchi.*

| | |
|---|---|
| Acute Bronchitis | 2 |

## III. DISEASES OF THE EAR.

| | |
|---|---|
| Earache | 29 |
| Impacted Cerumen | 16 |
| Imperfect Hearing (without apparent cause) | 30 |
| Imperfect Hearing (following infectious diseases) | 10 |
| Otitis Media, Catarrhal | 1 |
| Otitis Media, Suppurative, Acute | 3 |
| Otitis Media, Suppurative, Chronic | 96 |
| | 185 |

## IV. DISEASES OF THE EYE.

| | |
|---|---|
| Foreign Bodies | 3 |

### *2. Eyelids.*

| | |
|---|---|
| Blepharitis | 64 |
| Blepharo-spasm | 5 |
| Chalazion | 3 |
| Ecchymosis | 2 |
| Stye | 13 |
| Trachoma | 4 |
| Tumor | 2 |
| | 93 |

### *3. Lachrymal Organs.*

| | |
|---|---|
| Excessive Lachrymation | 4 |

### *4. Conjunctiva.*

| | |
|---|---|
| Conjunctivitis: | |
| (a) Acute Catarrhal | 34 |
| (b) Chronic | 26 |
| (c) Phlyctenular | 7 |
| (d) Suppurative | 2 |
| (e) Granular | 2 |
| Ecchymosis | 1 |
| Optic Atrophy | 1 |
| | 73 |

### *5. Cornea.*

| | |
|---|---|
| Keratitis | 2 |
| Kerato-Iritis | 1 |
| Opacity | 7 |
| Trauma | 1 |
| Ulcer | 7 |
| | 18 |

### *6. Iris.*

| | |
|---|---|
| Coloboma | 1 |
| Iritis | 1 |
| | 2 |

### 7. *Muscles.*

| | |
|---|---|
| Nystagmus | 3 |
| Strabismus: | |
| (a) Convergent | 83 |
| (b) Divergent | 16 |
| | 102 |

### 8. *Defects of Vision.*

| | |
|---|---|
| Blindness (of one eye) | 9 |
| Cataract | 2 |
| Imperfect sight | *1363 |
| | 1374 |

### V. Diseases of the Skin.

| | |
|---|---|
| Acne | 7 |
| Abrasion | 17 |
| Chapped Hands | 9 |
| Chapped Lip | 7 |
| Dermatitis: | |
| (a) Simple | 21 |
| (b) Venenata | 17 |
| (c) Exfoliative | 1 |
| Eczema | 130 |
| Erythema Simplex | 3 |
| Furuncle | 25 |
| Herpes: | |
| Simplex | 81 |
| Impetigo Contagiosa | 56 |
| Insect Bites | 7 |
| Pediculosis: | |
| (a) Capitis | 690 |
| (b) Corporis | 10 |
| Psoriasis | 8 |
| Purpura Simplex | 3 |
| Scabies | 78 |
| Seborrhea | 5 |
| Splinter under Nail | 3 |
| Tinea Tricophytina (Ringworm) | 66 |
| Urticaria | 6 |
| Verruca | 12 |
| Wen | 6 |
| | 1268 |

### VI. Miscellaneous Diseases.

| | |
|---|---|
| Abscess | 7 |
| Adenitis: | |
| (a) Cervical | 44 |
| (b) Sub-Maxillary | 7 |
| Adherent Prepuce | 6 |
| Anemia | 30 |
| Backwardness | 17 |
| Biting Nails | 1 |
| Burns | 16 |
| Cardiac Diseases | 8 |
| Certificates of Vaccination | 514 |
| Chilblains | 2 |
| Cigarette Smoking (admitted) | 3 |
| Constipation | 12 |
| Chorea | 7 |
| Contusions | 15 |
| Debility | 6 |
| Deformities: | |
| (a) Bow Legs | 1 |
| (b) Hip Disease | 2 |
| (c) Knock Knee | 1 |
| (d) Pott's Disease | 6 |
| (e) Scoliosis | 4 |
| (f) Tuberculous Joints | 2 |
| Diphtheria Contacts | 43 |
| Dislocations | 3 |
| Dog Bite | 3 |
| Dwarf | 1 |
| Enuresis | 5 |
| Epilepsy | 3 |
| Fractures | 3 |
| Frequent Micturition | 6 |
| Ganglion | 1 |
| Habit Spasm | 2 |
| Headache (habitual) | 25 |
| Hydrocephalus | 2 |
| Infected Areas (following trauma, acne, herpes, etc.) | 588 |
| Infected Finger | 20 |
| Indigestion | 11 |
| Lisping | 17 |
| Malnutrition | 36 |
| Mastitis | 1 |
| Masturbation | 1 |
| Mental Deficiency (not in Special Schools) | 48 |
| Myositis | 1 |
| Nervousness | 35 |
| Neuralgia | 2 |
| Paralysis: | |
| (a) Arms | 3 |
| (b) Face | 1 |
| (c) Legs | 2 |
| Rheumatism | 1 |

---

*Of these 807 failed to visit department oculist, but some may have visited family oculist.

| | | | |
|---|---|---|---|
| Sinovitis | 1 | Unclassified | 78 |
| Stuttering | 10 | Wounds | 16 |
| Torti-collis | 1 | | |
| Tumor of Cheek | 1 | Total | 1682 |

### SUMMARY.

| | |
|---|---|
| Specific Infectious Diseases | 121 |
| Oral and Respiratory Diseases | 943 |
| Diseases of the Ear | 185 |
| Diseases of the Eye | 1,669 |
| Diseases of the Skin | 1,267 |
| Miscellaneous Diseases | 1,682 |
| Found Free from Disease | 555 |
| Cases examined and reporting at oculist's office | 632 |
| Total | 7,054 |

| | |
|---|---|
| Number of pupils examined in the Schools | 3,419 |
| Number of pupils examined at City Hall | 1,728 |
| Number of pupils examined at their Homes | 184 |
| Total | 5,331 |

### REPORTS FROM TEACHERS AS TO ACTION TAKEN.

| | |
|---|---|
| Number reported as having followed advice given | 1,733 |
| “ “ not “ “ “ “ | 768 |
| “ “ promising to follow in the future | 137 |
| Total number reported | 2,638 |

Jan. 30, 1910.

*To the Superintendent of Health, Providence, R. I.*

DEAR SIR: I herewith submit the report of the oculist for the examination of the eyes of school children referred to my office during the school year 1908-1909.

Very respectfully,

DR. LEWIS B. PORTER.

## REPORT OF OCULIST.

### 1908–1909.

| | |
|---|---|
| Number of new cases seen | 632 |
| “ “ office visits | 1,032 |
| “ “ pairs of glasses prescribed | 483 |
| “ “ eyes with vision equalling $^{20}/_{15}$ | 31 |
| “ “ “ “ “ “ $^{20}/_{20}$ | 227 |
| “ “ “ “ “ “ $^{20}/_{30}$ | 274 |

| | |
|---|---|
| Number of eyes with vision equalling $^{20}/_{40}$ | 141 |
| “ “ “ “ “ “ $^{20}/_{50}$ | 86 |
| “ “ “ “ “ “ $^{20}/_{70}$ | 134 |
| “ “ “ “ “ “ $^{20}/_{100}$ | 125 |
| “ “ “ “ “ “ $^{20}/_{200}$ | 121 |
| “ “ “ “ “ less than $^{20}/_{200}$ | 45 |
| “ “ “ “ total loss of sight | 4 |
| “ “ children in which it was impossible to estimate vision | 18 |
| “ “ “ with Hypermetropia | 101 or 18% |
| “ “ “ “ Hypermetropic astigmatism | 65 or 11½% |
| “ “ “ “ Compound “ “ | 226 or 40% |
| “ “ “ “ Myopia | 16 or 3% |
| “ “ “ “ Myopic astigmatism | 4 or ¾ of 1% |
| “ “ “ “ Compound myopic astigmatism | 32 or 6% |
| “ “ “ “ Mixed astigmatism | 31 or 6% |
| “ “ “ “ Antimetropia | 5 or ¾ of 1% |
| “ “ “ “ Anisometropia | 64 or 12% |
| “ “ “ “ Convergent strabismus | 60 |
| “ “ “ “ Divergent strabismus | 14 |
| “ “ “ “ Amblyopia from disuse of eyes resulting from strabismus | 46 |
| “ “ “ “ Acute conjunctivitis | 4 |
| “ “ “ “ Chronic “ | 13 |
| “ “ “ “ Acute catarrhal conjunctivitis (Pink Eye) | 3 |
| “ “ “ “ Phlyctenular “ | 9 |
| “ “ “ “ Follicular “ | 2 |
| “ “ “ “ Trachoma | 5 |
| “ “ “ “ Opacities of cornea | 13 |
| “ “ “ “ Ulcers of cornea | 5 |
| “ “ “ “ Foreign bodies on cornea | 2 |
| “ “ “ “ Buphthalmus (one eye) | 1 |
| “ “ “ “ Leucoma adherans | 1 |
| “ “ “ “ Traumatic Keratitis | 1 |
| “ “ “ “ Cataracts | 3 |
| “ “ “ “ Aphakia | 1 |
| “ “ “ “ Choroiditis | 1 |
| “ “ “ “ Retino-choroiditis | 1 |
| “ “ “ “ Atrophy optic nerve | 3 |
| “ “ “ “ Blephero-conjunctivitis | 14 |
| “ “ “ “ Pediculosis ciliaris | 1 |
| “ “ “ “ Chalazion | 10 |
| “ “ “ “ Iritis | 1 |
| “ “ “ “ Micropthalmus | 1 |
| “ “ “ “ Ptosis | 3 |
| “ “ “ “ Retinitis | 4 |
| “ “ “ who did not return to complete examination | 38 |

The Dolman Optical Co. which makes a special price for school children, reports furnishing glasses for 309 children during the school year 1907-8, and for 311 in 1908-9.

The relation of the schools to the prevalence of scarlet fever and diphtheria was discussed quite fully in the report for 1908, p. 17, and though school outbreaks do occur, the conclusion was reached that there is not usually very much spread of these two diseases in the public schools. Previous to 1909 there were recorded 20 outbreaks of diphtheria, and 7 of scarlet fever in the schools. In 1909 it did not seem to me that there was any outbreak of diphtheria or scarlet fever due to infection in school. At Somerset Street there was 1 case in February, 2 in March, 3 in April, and 3 in May, but there was much diphtheria in the neighborhood, and there seemed to be no school connection between the cases.

At the Almy Street School there were 3 children out with diphtheria about October 1, and several other children with sore throats. One of these proved to be scarlet fever, and negative cultures were obtained from the others before they were allowed in school. Cultures were taken from the throat and nose of 44 children in the school, and barred types of diphtheria bacilli were found in 4 who were excluded from school until they were free from germs.

At Elmwood Avenue there were 8 cases from November 1 to November 28, but several of the cases were due to neighborhood contact outside of the school. Cultures were taken from some of the children in school who had sore throats, but no diphtheria bacilli were found.

About the middle of November there was an outbreak in a school just over the city line in North Providence which was closed in consequence. A number of cases of sore throat were reported in the Greeley Street and Branch Avenue primary schools, and the school inspector thought best to take cultures from all who had sore throats, and also from other children in their families. There was only one case of diphtheria in the Greeley Street school, and none at Branch Avenue. Of 122 children examined in the two schools 52 showed some form of diphtheria bacillus, mostly of the barred type. These children were excluded for a month, and were readmitted without cultures. In none of them did a well marked case of diphtheria develop, nor was there any in the schools after their readmission. I doubt very much whether there was much if any infection acquired in any of these schools.

There was only one school in which it was suspected that cases of scarlet fever were contracted. At Niagara Street a child 8 years old, living at 116 Sassafras Street, had a sore throat, with no rash noticed, and was out of school from January 18 to 20, when she returned. Cases of scarlet fever developed in pupils on January 22, 24, and 27, and one or two others had suspicious sore throats. There were also cases on February 8, March 3 and March 16. It is probable that the first named child was the cause of some at least of these cases.

The following table shows the number of cases of scarlet fever and diphtheria which occurred in the schools from January to June, 1908, and during the school year 1908-9. There were during the latter year 106 public schools with an enrolment of about 29,000, and 9 parochial schools with 5,700, and a few private schools with 465. Of course during an exceptional prevalence of any disease there must be an increased number of cases in the schools without in any way implying that the disease is due to school attendance.

NUMBER OF CASES OF SCARLET FEVER AND DIPHTHERIA IN SCHOOL-CHILDREN DURING SCHOOL YEAR.

| DIPHTHERIA. | | | SCARLET FEVER. | | |
|---|---|---|---|---|---|
| No. of Cases per School. | No. of Schools. | | No. of Cases per School. | No. of Schools. | |
| | 1908, Jan.-June. | 1908-9. | | 1908, Jan.-June. | 1908-9. |
| 1 | 39 | 28 | 1 | 33 | 33 |
| 2 | 18 | 44 | 2 | 26 | 36 |
| 3 | 18 | 24 | 3 | 30 | 21 |
| 4 | 20 | 28 | 4 | 8 | 16 |
| 5 | 10 | 20 | 5 | 15 | 5 |
| 6 | ........ | 48 | 6 | 6 | 12 |
| 7 | ........ | 35 | 7 | ........ | 7 |
| 8 | 8 | 32 | 14 | ........ | 14 |
| 9 | ........ | ........ | | | |
| 10 | 10 | 10 | | | |
| 11 | ........ | 11 | | | |
| 12 | ........ | 12 | | | |
| 13 | ........ | 13 | | | |
| 17 | 17 | 17 | | | |
| Total | 140 | 322 | Total | 118 | 144 |

The possibility of the excessive number of cases of diphtheria in Bridgham Street and Elmwood Avenue schools being due to school infection was discussed in the report for 1908. The cases in Somerset Street were so scattered that there was no reason for thinking them due to infection in school.

The question of scarlet fever outbreaks in the Smith Street School in 1908, and at Niagara Street in 1909 are considered in the reports for these years. Besides these there were only two schools in which even as many as three cases occurred during the space of a month. Owing to the prevalence of diphtheria in the winter of 1908-9 there were many cases among school children, but there was no evidence of a marked outbreak in any school. In five schools the number of cases ranged from 10 to 17. In one, the Immaculate Conception, there were 7 cases from October 4 to November 18, and infection in school was suspected, but no evidence of it was secured, In the other 4 schools the cases were pretty well scattered, no more than 4 occurring in any one month. Among all the schools there were 2 in which 6 cases occurred within a month, 1 in which 5 cases so occurred, 12 in which there were 4, and 5 in which there were 3 cases within a month.

It is generally the custom of this department not to exclude from school children in a house where there is scarlet fever or diphtheria, except those of the family in which the disease actually exists. If, however, it is believed that there will be no isolation, and that there will possibly be a mingling of all the children in the house, they are all excluded. In the majority of instances the other children in the house are allowed to attend school.

The rule in Providence is to exclude from school all children living in diphtheria families for four weeks from the beginning of the last case. But if two sets of nose and throat negatives can be obtained from each school child in the family at any time after the warning sign has been removed, permits are given. When the four weeks have elapsed, even if diphtheria bacilli are found, school permits are nevertheless given. During the last three years this happened oftener than formerly. In all, permits were in 1909 given to 116 such children. Of these 73 had been sick. Of the 116 children 17 were reported by the State laboratory merely as carrying diphtheria bacilli, 12 of whom had been sick, 4 others showed granular types of the bacilli, of whom 2 had been sick, and 95 the barred forms, of whom 12 had been sick. It is desirable to know what the result has been of admitting these children to school. Of these children 98 were admitted to school without a single case of diphtheria developing in the school within one month after their readmission. Of these children 21 had been sick, of whom 7 showed "KL," 2 granular types, and 12 barred types of diphtheria bacilli. Seventy-three had not been sick, and of these 4 were carrying "KL," and 69 barred forms. Thirteen children were admitted to schools in which 1 case of diphtheria occurred within one month after admission. Of these 5 had been sick, of whom 4 carried "KL" and 1 granular bacilli. Eight had not been sick, of whom 1 carried "KL," and 7 barred bacilli. The admission of 3 children was followed by two cases of diphtheria within a month, but in no instance was there reason for believing that the carriers were the cause of the cases. All 3 carried barred types of diphtheria bacilli. In 2 instances no record was made of the school which the children attended.

In diphtheria, children in the non-infected families are not allowed to go to school until a negative culture has been obtained from the throat and nose of each. Of the 355 children in 173 families who were thus examined in 1909, 77 showed the presence of diphtheria bacilli, and the children in these families were therefore not given permits. The proportion of children found infected, 21 per cent, is less than last year when it was 30.

During 1909 permits were given to 134 children living in 73 "infected houses," but not in infected families, to attend school. All of these had had two negative cultures. During the past thirteen years the figures are 1,178 children in 543 families. In none of these did the disease develop, which indicates that it is quite safe to permit children in the infected house but not in the infected family, to attend school under the conditions named.

In scarlet fever children in the non-infected families in the house are in most instances allowed to attend school. If they have had the disease previously they are given their permits at once, but if they have not had the disease they are usually kept out of school for a week. During 1909 permits were given to 179 susceptible children in 103 families.

During the past thirteen years the figures are 945 children in 538 families. Previous to 1904 none of the children who received permits developed scarlet fever, but in that year there were 5 cases in 2 families. In one instance in 1908 another child in the family developed the disease after a permit had been given to the sister. In 1909 at 187 Allston Street, a child in the second family was taken sick on the sixth day after the permit was given, and at 165 Chalkstone Avenue 1 was sick on the 21st day.

The agency of the public schools in the transmission of scarlet fever and diphtheria was discussed in the report for 1903, p. 112, and 1908, p. 20.

## DISINFECTION.

Disinfection after communicable disease in this city is not compulsory, and is only done when desired by the family. It is done by this department without charge. A statement of disinfections for separate years may be found in previous reports.

The following gives the number since 1885:

### TABLE IV.

### DISINFECTIONS.

| YEAR. | Scarlet Fever. | Diphtheria. | Phthisis. | Miscellaneous. | Total. |
|---|---|---|---|---|---|
| 1885-1891......... | ......... | .............. | .......... | ............ | 907 |
| 1892-1895......... | 1,145 | 280 | 6 | 37 | 1,468 |
| 1896-1900......... | 1,439 | 1,599 | 80 | 134 | 3,252 |
| 1901.............. | 238 | 421 | 20 | 29 | 708 |
| 1902.............. | 186 | 362 | 23 | 62 | 633 |
| 1903.............. | 393 | 506 | 34 | 49 | 982 |
| 1904.............. | 864 | 600 | 29 | 33 | 1,526 |
| 1905.............. | 298 | 98 | 38 | 50 | 484 |
| 1906.............. | 328 | 18 | 51 | 28 | 425 |
| 1907.............. | 596 | 17 | 55 | 19 | 687 |
| 1908.............. | 310 | 17 | 45 | 29 | 401 |
| 1909.............. | 52 | 3 | 35 | 7 | 97 |
| Total......... | 5,849 | 3,921 | 416 | 477* | 11,570 |

* Of these the following were for smallpox: in 1892, 6; in 1894, 12; in 1895, 1; in 1902, 43; in 1903, 8; in 1904, 2; in 1905, 1; and in 1906, 1.

Besides the above, the disinfector made 357 ambulance calls, removed 305 diphtheria cards without disinfection, made 52 extra visits to scarlet fever houses to see if desquamation had ceased, and removed the placard without disinfection from 302 scarlet fever houses. Goods were disinfected in the stream disinfector 7 times.

It has seemed to me that disinfection is useless after diphtheria unless it is shown with a reasonable degree of certainty that all members of the family are free from diphtheria bacilli. Consequently it was decided early in March, 1905, to give up disinfecting after diphtheria unless two successive negative cultures should be obtained from every member of the family. As few are willing to submit to the taking of the cultures, few disinfections have been done since that time. In the following table only those recurrences are counted which occurred within two months after the removal of the warning sign. It is true that some nominal recurrences do occur after the second month, but as shown in the table on the next page they are few in number.

The number of recurrences after disinfection, the number of infected families and the rate of recurrence during the years 1902 and 1905 was as follows:

DIPHTHERIA, 1902–5.

| YEAR. | Infected Families. | Recurrences. | Rate. |
|---|---|---|---|
| 1902 | 358 | 6 | 1.67 |
| 1903 | 453 | 7 | 1.54 |
| 1904 | 559 | 10 | 1.78 |
| 1905 | 87 | 2 | 2.30 |
| Total | 1,457 | 25 | 1.71 |

The number of recurrences since February, 1905, where there was no disinfection, and the ratio to infected families where there was no disinfection is as follows:

DIPHTHERIA, 1905–9.

| YEAR. | Infected Families. | Recurrences. | Rate. |
|---|---|---|---|
| 1905 | 258 | 4 | 1.55 |
| 1906 | 259 | 4 | 1.55 |
| 1907 | 343 | 7 | 2.04 |
| 1908 | 687 | 17 | 2.34 |
| 1909 | 472 | 10 | 2.12 |
| Total | 2,019 | 42 | 2.08 |

The 10 recurrences tabulated in 1909 occurred on the 1st, 3d, 6th, 11th, 17th, 18th, 23d, 26th, 58th, and 59th day after the removal of the warning sign, and on the 19th, 24th, 32d, 33d, 37th, 40th, 49th, and 61st day, and in the 3d and 4th month of the initial sickness. In two of these instances the initial case was found to be harboring diphtheria bacilli after the second case developed. Besides the above 10 cases which were reckoned as recurrences, there were 2 in the 3d month, and 1 in the 5th month after the removal of the placard, or in the 3d, 4th, and 5th month of the initial sickness. In one of these instances the initial case was harboring diphtheria bacilli after the second case developed, and in another instance the infection remained in the children of another family in the house. In the other instance the secondary case developed after the return of the initial case from the hospital, and might as well be reckoned a "return case" as a recurrence, though it is improbable that it was either. All these cases are, however, here reported, so that anyone who doubts my conclusion that these figures indicate that no harm results from the omission of terminal disinfection, may be able to interpret the facts for himself.

All these instances of the possible recurrence of diphtheria in the family except the one in the 5th month which might well have been a recurrence, are given in the following table, which shows how often diphtheria has apparently recurred in an infected family. It gives the day of the initial sickness and the day of release from isolation on which the recurrence took place.

## TABLE V.

### DIPHTHERIA 1896-1909.

Recurrence in same family, showing the day of the initial sickness and the day of release from isolation on which recurrence took place.

| Day of Initial Sickness. | Number of Cases. | Day of Initial Sickness. | Number of Cases. | Day of Release from Isolation. | Number of Cases. | Day of Release from Isolation. | Number of Cases. |
|---|---|---|---|---|---|---|---|
| 1 | .......... | 38 | 1 (1) | 1 | 4 (1) | 38 | .......... |
| 2 | .......... | 39 | 3 (1) | 2 | 7 (2) | 39 | .......... |
| 3 | .......... | 40 | 3 (1) | 3 | 7 (2) | 40 | 1 (1) |
| 4 | .......... | 41 | 1 | 4 | 9 (3) | 41 | 1 |
| 5 | .......... | 42 | 1 | 5 | 5 (4) | 42 | .......... |
| 6 | 1 | 43 | .......... | 6 | 6 (2) | 43 | .......... |
| 7 | 2 (2) | 44 | .......... | 7 | 7 | 44 | .......... |
| 8 | 1 | 45 | 3 (2) | 8 | 3 (1) | 45 | .......... |
| 9 | .......... | 46 | 2 | 9 | 6 (3) | 46 | .......... |
| 10 | 1 | 47 | 2 (1) | 10 | 4 (1) | 47 | .......... |
| 11 | 1 | 48 | 1 (1) | 11 | 6 (4) | 48 | 2 (2) |
| 12 | 1 | 49 | 2 (1) | 12 | 1 (1) | 49 | 1 |
| 13 | 2 | 50 | 1 | 13 | 1 (1) | 50 | .......... |
| 14 | 2 | 51 | 1 | 14 | 4 (1) | 51 | .......... |
| 15 | 4 | 52 | .......... | 15 | .......... | 52 | .......... |
| 16 | 2 (1) | 53 | .......... | 16 | 1 (1) | 53 | 1 |
| 17 | 2 | 54 | .......... | 17 | 3 (1) | 54 | .......... |
| 18 | 4 (1) | 55 | 1 | 18 | 4 (1) | 55 | .......... |
| 19 | 1 (1) | 56 | .......... | 19 | .......... | 56 | .......... |
| 20 | 3 (1) | 57 | 1 (1) | 20 | .......... | 57 | .......... |
| 21 | 2 | 58 | 1 (1) | 21 | .......... | 58 | 1 (1) |
| 22 | 2 (1) | 59 | 1 | 22 | 1 (1) | 59 | 1 (1) |
| 23 | 1 (1) | 60 | .......... | 23 | 1 (1) | 60 | 2 (1) |
| 24 | 5 (3) | 3 ms | 11 (6) | 24 | 1 (1) | 3 ms | 5 (2) |
| 25 | 4 (1) | 4 “ | 11 (3) | 25 | 1 (1) | 4 “ | 5 (2) |
| 26 | 7 (2) | 5 “ | 3 (1) | 26 | 3 (1) | 5 “ | 2 |
| 27 | 2 (1) | 6 “ | .......... | 27 | .......... | 6 “ | .......... |
| 28 | 2 (1) | 7 “ | 1 | 28 | 1 | 7 “ | 1 |
| 29 | 2 (1) | 8 “ | 3 | 29 | .......... | 8 “ | 3 |
| 30 | 1 (1) | 9 “ | 1 | 30 | 2 (2) | 9 “ | 1 |
| 31 | 1 (1) | 10 “ | 1 | 31 | 2 | 10 “ | 1 |
| 32 | 3 (3) | 11 “ | .......... | 32 | 2 (1) | 11 “ | |
| 33 | 2 (1) | 12 “ | .......... | 33 | 2 | 12 “ | |
| 34 | .......... | | | 34 | .......... | | |
| 35 | 1 (1) | | | 35 | .......... | | |
| 36 | 2 (2) | | | 36 | .......... | | |
| 37 | 3 (1) | | | 37 | 1 | | |
| Totals | | | 123 (47) | | | | 123 (47 |

The figures in parenthesis refer to cases where there was no official disinfection they are included in the others.

Besides the above there were 9 recurrences in other families in the house after the removal of the warning sign. These were on 7th, 9th and 23d day, and in the 3d, 6th, 6th, 6th, 8th and 9th month after the removal of the warning sign, and on the 13th, 39th, and 59th day, and in the 3d, 5th, 6th, 6th, 8th and 9th month of the initial sickness.

The danger of omitting disinfection is probably better measured by the development of the disease in well persons who go away from home during the sickness and return after the warning sign has been removed. Between 1889 and 1904 inclusive there thus returned to their homes in diphtheria 1,013 persons, of whom 9 were attacked on their return. Terminal disinfection was practiced in substantially every instance. Since the beginning of 1905 there have been removed from diphtheria families 585 persons, of whom 510 were minors. These went away to escape the disease, or to to be able to go to school or to work. In one instance a child returned 3 days after the funeral of the first case and was taken sick 6 days later. Of the remainder 16 were taken sick while away from their homes. The other 569 persons remained well. The percentage of attacks among those returning home after disinfection, previous to 1905, was 0.88, and since 1905 the percentage of attacks where there was no disinfection was 0.18.

It has seemed probable that disinfection is no more necessary after scarlet fever than after diphtheria, and since November 1, 1908, terminal disinfection for this disease has not been urged, though it has been offered.

The number of recurrences after disinfection for scarlet fever, the number of infected families, and the rate of recurrence during the years 1904 to 1908, was as follows:

SCARLET FEVER, 1904–9.

| YEAR. | Infected Families. | Recurrences. | Rate. |
|---|---|---|---|
| 1904 | 868 | 12 | 1.38 |
| 1905 | 298 | 2 | .67 |
| 1906 | 398 | 9 | 2.26 |
| 1907 | 540 | 8 | 1.48 |
| 1908 | 273 | 3 | 1.09 |
| 1909 | 52 | 3 | 5.77 |
| 1904–9 | 2,429 | 37 | 1.52 |

During the last two years the recurrences where there was no disinfection were as follows:

SCARLET FEVER, 1908–9.

| YEAR. | Infected Families. | Recurrences. | Rate. |
|---|---|---|---|
| 1908 | 40 | 1 | 2.50 |
| 1909 | 377 | 10 | 2.65 |
| 1908-9 | 417 | 11 | 2.64 |

Of the 3 recurrences of scarlet fever in the same family when there was disinfection, one was on the 46th day after disinfection, and in the 3d month of the initial sickness. One was on the 9th day after disinfection and on the 14th day of the sickness of the first case which died, and one was on the 13th day after removal to the hospital, and the 15th day of the sickness.

The 10 recurrences where there was no disinfection were on the 2d, 3d, 3d, 4th, 8th, 9th, 12th, 13th, 15th and 54th day of release from isolation, and on the 5th, 6th, 17th, 31st, 37th, 41st, 44th, 48th, 50th day, and in the 3d month of the initial sickness. In the 3 instances first mentioned, the first cases were removed to the hospital. Besides the above there were recurrences in the 4th and 6th month of release from isolation, or in the 5th and 6th month of the initial sickness.

The rate of recurrence when there was no disinfection is somewhat greater than it has been in recent years when there was disinfection, but does not exceed the margin of error, and was exceeded in 1906.

The following table shows how often scarlet fever has apparently recurred in an infected family during the last sixteen years. It gives the day of the initial sickness and the day of release from isolation on which the recurrence took place.

## TABLE VI.

### SCARLET FEVER 1896-1909.

Recurrence in same family, showing the day of the initial sickness and the day of release from isolation on which recurrence took place.

| Day of Initial Sickness. | Number of Cases. | Day of Initial Sickness. | Number of Cases. | Day of Release from Isolation. | Number of Cases. | Day of Release from Isolation. | Number of Cases. |
|---|---|---|---|---|---|---|---|
| 1 | | 38 | 1 | 1 | 3 | 38 | 1 |
| 2 | | 39 | 2 | 2 | 6 (1) | 39 | |
| 3 | 1 | 40 | | 3 | 5 (2) | 40 | 1 |
| 4 | 1 | 41 | 2 (1) | 4 | 4 (1) | 41 | |
| 5 | 1 (1) | 42 | | 5 | 4 | 42 | |
| 6 | 1 (1) | 43 | 3 | 6 | 1 | 43 | 1 |
| 7 | 3 | 44 | 2 (1) | 7 | 4 | 44 | |
| 8 | | 45 | 1 | 8 | 4 (1) | 45 | |
| 9 | | 46 | 1 | 9 | 3 (1) | 46 | 1 |
| 10 | 2 | 47 | | 10 | 1 | 47 | |
| 11 | 1 | 48 | 6 (2) | 11 | 3 | 48 | 1 |
| 12 | | 49 | 1 | 12 | 3 (1) | 49 | 2 |
| 13 | 1 | 50 | 2 (1) | 13 | 5 (1) | 50 | 1 |
| 14 | 2 | 51 | 2 | 14 | | 51 | 1 (1) |
| 15 | 1 | 52 | | 15 | 2 (1) | 52 | |
| 16 | 2 | 53 | 1 | 16 | 2 | 53 | |
| 17 | 1 (1) | 54 | | 17 | 2 | 54 | 1 (1) |
| 18 | 1 | 55 | 1 | 18 | 2 (1) | 55 | 1 |
| 19 | | 56 | 2 | 19 | 1 | 56 | |
| 20 | | 57 | | 20 | 1 | 57 | 1 |
| 21 | 1 | 58 | 1 (1) | 21 | | 58 | |
| 22 | | 59 | 2 | 22 | | 59 | |
| 23 | | 60 | | 23 | 1 | 60 | 1 |
| 24 | | 3 ms. | 21 (4) | 24 | | 3 ms. | 7 (1) |
| 25 | | 4 " | 4 | 25 | 2 (1) | 4 " | 4 (1) |
| 26 | | 5 " | 5 (1) | 26 | | 5 " | 1 |
| 27 | | 6 " | 1 | 27 | 1 | 6 " | 1 (1) |
| 28 | | 7 " | 2 (1) | 28 | | 7 " | 6 |
| 29 | | 8 " | 2 | 29 | 1 | 8 " | |
| 30 | 2 | 9 " | 2 | 30 | | 9 " | 1 |
| 31 | 1 (1) | 10 " | 1 | 31 | 1 | 10 " | |
| 32 | 1 | 11 " | 1 | 32 | 1 | 11 " | 2 |
| 33 | 1 | 12 " | | 33 | | 12 " | |
| 34 | 2 | 15 " | 1 | 34 | | 16 " | 1 |
| 35 | 1 | | | 35 | | | |
| 36 | 1 | | | 36 | 1 (1) | | |
| 37 | 2 (1) | | | 37 | | | |
| Totals | | | 100 (17) | | | | 100 (17) |

The figures in parenthesis refer to cases where there was no official disinfection; they are included in the others.

Besides the above there were recurrences in other families in the house in 7 instances. These were on the 1st, 1st, 9th, 21st, 26th, 35th day, and in the 5th month of release from isolation, and on the 18th, 20th, 50th, 50th, 55th day, and in 3d and 6th months after the beginning of the initial sickness. In the two instances in which the recurrence was on the 1st day after release from isolation, the cases in the first family had only been removed to the hospital on that day, and were in the early stages of the disease. There were then only 5 instances of recurrence in other families at a late period of the sickness, and 1 of these was in the 6th month.

The danger of omitting disinfection is probably better measured by the development of the disease in well persons who go away from home during the sickness and return after the warning sign has been removed. Between 1889 and 1908, inclusive, 1,648 persons who had never had the disease thus returned to their homes, of whom 12 were later taken sick. In almost every instance during this period disinfection was practiced. In 1909, 11 persons came back to houses that were disinfected, making in all 1,659 persons, of whom 12 or 1.99 per cent. were taken sick. During 1908 and 1909, 67 persons returned to scarlet fever houses where there was no official terminal disinfection, and none were afterwards sick with the disease.

## VACCINATION.

During the year 1909 the number of persons vaccinated was 2,955. The only public vaccination has been at the Fourth Ward Room on Fountain Street Friday afternoons. The number of certificates of vaccination issued during the year was 2,955, the same as the number vaccinated. The following table gives the number of persons vaccinated and the number of certificates issued since 1856:

## TABLE VII.

### VACCINATIONS.

| YEAR. | Persons Vaccinated. | Certificates Issued. |
|---|---|---|
| 1856-1880 | 24,142 | 32,585 |
| 1881-1890 | 28,567 | 17,525 |
| 1891-1900 | 22,049 | 24,803 |
| 1901-1905 | 23,899 | 15,483 |
| 1906 | 2,763 | 3,177 |
| 1907 | 2,659 | 2,924 |
| 1908 | 3,352 | 3,319 |
| 1909 | 2,955 | 2,955 |
| Total, 1856-1909 | 110,386 | 102,771 |

## QUARANTINE.

The custom at this port is for the signal officer to hail all vessels arriving from a foreign port and ascertain whether they have a clean bill of health, and whether there is, or has been, any sickness on board. If there is sickness on board, or if they have not a clean bill of health, or if they come from any port outside of British North America, they are brought to anchor, and inspected by a physician from this department.

The following is the number of vessels boarded by the health officer during the last ten years, and the places from which they sailed:

## TABLE VIII.

### QUARANTINE.

| | 1900. | 1901. | 1902. | 1903. | 1904. | 1905. | 1906 | 1907. | 1908. | 1909. |
|---|---|---|---|---|---|---|---|---|---|---|
| British Provinces | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| West Indies | 10 | 5 | 47 | 29 | 3 | 6 | 6 | 8 | 4 | 4 |
| Italy | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| South America | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turkey | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Russia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Azores and Cape Verde Islands | 1 | 4 | 3 | 2 | 1 | 2 | 2 | 0 | 0 | 1 |
| Africa | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Great Britain | 0 | 0 | 3 | 39 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 11 | 9 | 54 | 70 | 6 | 11 | 9 | 8 | 4 | 5 |

### RABIES.

This disease appeared in Providence in July, 1906, for the first time in many years, and cases have been occurring at intervals ever since. The disease reached its maximum in November, 1906, when 14 persons were bitten by rabid animals. A three months' muzzling law went into effect Jan. 1, 1907, and since that time rabies has not been epidemic in the city. Occasionally rabid animals are found, but they are mostly vagrants which stray in from adjoining towns.

The following table shows various facts of interest in regard to dogs and rabies for the year 1909:

| Month. | No. of animals examined at laboratory. | No. with Negri bodies. | No. of persons bitten by animals. | No. of persons bitten by rabid animals. | No. of persons taking the Pasteur treatment. |
|---|---|---|---|---|---|
| January | 1 | | 1 | | |
| February | | | | | |
| March | 1 | | 1 | | |
| April | 1 | | 1 | | |
| May | 1 | 1 | 1 | | |
| June | 2 | | 2 | | |
| July | 8 | | 9 | | |
| August | | | | | 2 |
| September | 1 | 1 | 1 | 1 | 1 |
| October | 1 | | 1 | | |
| November | 3 | 1 | 5 | 3 | 2 |
| December | 1 | | 1 | | |
| | 20 | 3 | 23 | 4 | 5 |

During the early part of the outbreak persons bitten by rabid animals were sent to New York for treatment, but since the latter part of November, 1906, all such have been treated at the Rhode Island Hospital by Dr. A. A. Barrows. Forty-three city cases were treated by Dr. Barrows, of which 8 were in 1906, 17 in 1907, 13 in 1908, 5 in 1909, and also 64 cases from out of the city. In none of these 107 cases did rabies afterwards develop.

The cost of the laboratory examinations of suspected animals in 1909 was $152; and the cost of the preventive treatment was $225.30; making the total cost of rabies to this department in 1909, $377.30.

### CERTAIN INFECTIOUS DISEASES, CASES AND DEATHS.

There were 220 deaths from diarrheal diseases in 1909, or 49 less than in 1908, and fewer than in any year since 1856.

There were 282 deaths from pulmonary tuberculosis in 1909, or 26 less than in the preceding year. The rate, 130 per 100,000 living, is the lowest recorded. This rate is misleading as many Providence people die outside the city. See discussion on another page.

The number of deaths from scarlet fever was 10, or 12 less than in the preceding year.

There have been no deaths from smallpox since 1902.

There were 25 deaths from typhoid fever, or 10 less than in 1908. The rate per 100,000 living was 11.9.

There were 53 deaths from diphtheria, or 25 less than in 1908, and 5 deaths from croup.

### PREVENTION OF INFANT MORTALITY.

As a large part of the mortality of infants under one year of age is due to disorders of the digestive system, and particularly to the diarrheal diseases, preventive measures have usually been largely concerned with instructing mothers as to methods of feeding, and in furnishing suitable milk. For many years circulars of instruction have been sent to mothers in Providence, and in 1906 these were revised by a committee of physicians, and since then a copy has been mailed to every mother as soon as the birth of her child is reported at this office. Unfortunately, these reports of births are not always promptly made, so that the instructions do not reach the mother as soon as is desirable. The circulars are printed in English, Italian, Yiddish, French, and Portuguese. Printed instructions in regard to the care of older children, two to six years, also are freely distributed.

For several years a committee of the Providence Medical Association has raised a sum of money which has been chiefly expended for visiting nurses for the summer months, who act under the auspices of the Providence District Nursing Association. The latter association employed one "babies' nurse" all through the year up to November, 1909, and since then has employed three. During the summer months four additional nurses were employed by means of the fund mentioned above. From June 1 to November 1, 595 children were under the care of the nurses for a longer or shorter time, and 4,030 visits were made. The District Nurses also maintained two babies' camps during the hot weather, at which 65 babies were cared for, of whom 5 died. During July and August there were 96 deaths from diarrheal diseases, 25 less than in the preceding year, and less than was ever before recorded. For the four months, June-September, there were 135 deaths, which also is the lowest record. For the year there were 196 deaths from diarrhea, of children under 2 years of age, which is 1 less than in 1905, which year had by far the lowest death rate from this cause ever before reported.

The following table shows the infant mortality from 1856 to 1908. The births for 1909 are not yet tabulated, so that the figures for that year are not available. The apparent increase in the mortality of infants up to about 1900 is probably not real, but is due to a better record of living births where the child survives only a short time. Infant mortality in Providence, though not very excessive, is higher than it ought to be, and active measures should be taken to lower it.

## TABLE IX.

### INFANT MORTALITY, 1856-1908.

| PERIODS. | Living Births | Still Births. | Ratio of still births to each 1,000 living births. | Deaths under 1 year. | Ratio of deaths under 1 year to each 1,000 living births. |
|---|---|---|---|---|---|
| 1856-1860 | 7,979 | 396 | 50 | 1,018 | 127 |
| 1861-1865 | 6,929 | 368 | 53 | 1,007 | 145 |
| 1866-1870 | 8,523 | 429 | 51 | 1,106 | 130 |
| 1871-1875 | 11,239 | 628 | 56 | 1,757 | 156 |
| 1876-1880 | 12,459 | 595 | 48 | 1,823 | 146 |
| 1881-1885 | 14,342 | 658 | 46 | 2,094 | 146 |
| 1886 1890 | 15,585 | 764 | 49 | 2,463 | 158 |
| 1891-1895 | 19,735 | 964 | 49 | 3,205 | 162 |
| 1896-1900 | 21,439 | 1,065 | 50 | 3,434 | 160 |
| 1901-1905 | 24,743 | 1,159 | 47 | 3,828 | 154 |
| 1906 | 5,456 | 222 | 41 | 847 | 155 |
| 1907 | 5,876 | 259 | 44 | 834 | 142 |
| 1908 | 5,832 | 269 | 46 | 775 | .......... |
| Total | 160,137 | 7,776 | 49 | 24,191 | 151 |

There has thus apparently been very little change in the infant mortality until the last year or two.

### TUBERCULOSIS.

During the year 148 cases of tuberculosis were reported by the physicians of the city, 59 from the Rhode Island Hospital, 284 from the district nurses, 5 from the patients or their families, and there were reported from the State Board of Health 327 positive results of sputum examination, which were not notified from other sources, 32 from the State sanatorium. In all, 855 living cases of tuberculosis came to the notice of this department during the year. Nearly every one of these was pulmonary. The following shows the cases reported and the deaths since 1905:

| Year. | Cases. | Deaths. |
|---|---|---|
| 1905 | 239 | 318 |
| 1906 | 453 | 307 |
| 1907 | 510 | 310 |
| 1908 | 600 | 308 |
| 1909 | 855 | 282 |

One of the most important measures employed in this city to control tuberculosis is the work of the visiting nurses under the League for the Suppression of Tuberculosis and the District Nursing Association acting together. Four nurses are employed.

During the year 1909 the nurses' attention was given to 826 persons on 7,970 visits. These cases were brought to the attention of the district nurse as follows:

| | |
|---|---|
| Nurses | 78 |
| Rhode Island Hospital Clinic | 373 |
| Other doctors | 218 |
| Patients and their friends | 63 |
| Organizing Charities | 25 |
| Health Department | 18 |
| Clergy, etc. | 13 |
| State Sanatorium | 28 |
| Overseer of the Poor | 8 |
| Other Societies | 2 |
| Total | 826 |

A large number of the cases from the clinic were first found by the nurses, but were not taken on until they had been diagnosed at the clinic. The cost of this nursing was about $3,000.

Many cases received assistance from the League for the Suppression of Tuberculosis, and about $2,000 was expended.

As indicated in a previous report, I do not think terminal disinfection in this disease is of much value, and have made no effort to have it done by this department. Nevertheless, it was requested by the physician or family in 35 instances in 1909, and done by this department.

The figures just given, of the number of deaths from pulmonary tuberculosis in Providence are misleading, because for several years an increasing number of the poor in the advanced stages of consumption have been sent to the state institutions at Howard, and have died there, and St. Joseph's Hospital has had a tuberculosis ward at Hill's Grove in Warwick, and many Providence people have died there. It has thus far been impossible to determine exactly the number of Providence residents who have died of consumption outside of the city. The following table shows this number, so far as it could be determined, for the last seven years, and it is probably approximately correct:

DEATHS FROM PHTHISIS.

| Year. | Deaths In Providence. | Deaths Outside City. | Total Deaths. | Rate per 100,000 living. |
|---|---|---|---|---|
| 1901 | 384 | 30 | 414 | 232 |
| 1902 | 374 | 37 | 411 | 227 |
| 1903 | 371 | 55 | 426 | 230 |
| 1904 | 342 | 47 | 389 | 201 |
| 1905 | 318 | 72 | 390 | 196 |
| 1906 | 307 | 59 | 366 | 180 |
| 1907 | 310 | 104 | 414 | 199 |
| 1908 | 308 | 95 | 403 | 189 |
| 1909 | 282 | 134 | 416 | 191 |

From this it appears that the low point in the true death-rate from phthisis was reached in 1906, and that there was an appreciable increase in 1907.

MEASLES.

Physicians are now required to report this disease, but comparatively few cases are reported, due chiefly to the fact that in measles the doctor is rarely called. The number reported has been as follows:

| | | | |
|---|---|---|---|
| 1896 | 278 | 1903 | 637 |
| 1897 | 84 | 1904 | 103 |
| 1898 | 48 | 1905 | 115 |
| 1899 | 451 | 1906 | 505 |
| 1900 | 901 | 1907 | 101 |
| 1901 | 41 | 1908 | 306 |
| 1902 | 43 | 1909 | 277 |

Besides measles and phthisis, which have been referred to, physicians are required to report the communicable diseases named below, but, sometimes neglect it. The following is the number of cases discovered by the inspector, not reported by the physician, since 1886:

TABLE X.

| YEAR. | Scarlet Fever. | Typhoid Fever. | Diphtheria. |
|---|---|---|---|
| 1886–1890 | 172 | 39 | 148 |
| 1891–1895 | 65 | 47 | 21 |
| 1896–1900 | 28 | 83 | 31 |
| 1901 | 0 | 21 | 7 |
| 1902 | 4 | 24 | 8 |
| 1903 | 9 | 14 | 13 |
| 1904 | 34 | 14 | 23 |
| 1905 | 3 | 12 | 6 |
| 1906 | 3 | 25* | 4 |
| 1907 | 10 | 5 | 2 |
| 1908 | 3 | 22 | 5 |
| 1909 | 4 | 8 | 3 |

* Eleven of these cases were discovered by the medical inspector while investigating a milk outbreak and it is probable that some of these if not all, would have been reported later by the attending physician.

In addition to the above, during 1909 13 cases of scarlet fever and 7 of diphtheria were discovered by the medical inspector where there was no physician in attendance. The school inspectors also discovered 7 cases of scarlet fever and 13 of diphtheria where there was no physician in attendance. Of the 76 cases of smallpox in the last twenty-three years, 23, or 31 per cent were not under the care of a physician, but were discovered in various other ways.

The following pages are devoted to the consideration of those diseases, the notification of which by physicians is fairly complete.

### TYPHOID FEVER.

Table XI shows the number of cases and deaths for each month during the last twenty-five years, and the case fatality each year during the last twenty-six years.

The State Board of Health offers to examine the blood of typhoid suspects by the Widal test, and of the 179 cases reported during the year 63 were subjected to the test, 50 of which proved to be positive. There were also 205 other negative tests reported to this department by the State Board of Health from cases not reckoned as typhoid.

## TABLE XI. TYPHOID FEVER.

| YEAR. | JAN. |  | FEB. |  | MAR. |  | APRIL. |  | MAY. |  | JUNE. |  | JULY. |  | AUG. |  | SEPT. |  | OCT. |  | NOV. |  | DEC. |  | Total Cases. | Total Deaths. | Case Fatality. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. |  |  |  |
| 1884 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 122 | **52** | 42.62 |
| 1885 | 6 | **3** | 7 | **4** | 8 | **2** | 7 | **2** | 5 | **4** | 5 | **3** | 2 | **2** | 6 | **4** | 15 | **6** | 8 | **5** | 11 | **8** | 4 | **1** | 84 | **44** | 52.28 |
| 1886 | 6 | **3** | 5 | .. | 2 | **5** | 5 | **5** | 5 | **3** | 3 | .. | 4 | **1** | 12 | **6** | 24 | **8** | 16 | **11** | 13 | **5** | 9 | **6** | 104 | **53** | 50.96 |
| 1887 | 5 | **6** | 1 | **3** | 4 | **3** | .. | .. | 3 | **2** | .. | **2** | 3 | **1** | .. | **8** | 10 | **3** | 9 | **7** | 18 | **2** | 10 | **2** | 63 | **39** | 59.09 |
| 1888 | 9 | **5** | 2 | .. | 4 | **3** | 3 | **3** | 2 | **6** | 2 | **1** | 6 | **1** | 13 | **5** | 20 | **8** | 23 | **9** | 177 | **15** | 142 | **47** | 403 | **103** | 25.55 |
| 1889 | 35 | **5** | 14 | **8** | 6 | **2** | 7 | **9** | 6 | **1** | 1 | **2** | .. | **1** | 13 | **6** | 29 | **4** | 34 | **3** | 31 | **12** | 21 | **6** | 197 | **59** | 29.79 |
| 1890 | 12 | **4** | 5 | **3** | 11 | **6** | 7 | **5** | 4 | **2** | 1 | **2** | 4 | **1** | 7 | **3** | 13 | **3** | 18 | **2** | 9 | **3** | 9 | **5** | 100 | **39** | 39.00 |
| 1891 | 6 | **4** | 3 | **2** | 5 | **5** | 5 | **1** | 6 | **2** | 5 | **3** | 9 | **3** | 17 | **6** | 17 | **6** | 29 | **5** | 74 | **16** | 14 | **9** | 190 | **62** | 32.63 |
| 1892 | .. | **8** | 4 | **5** | 13 | **2** | 14 | **3** | 5 | **5** | 6 | **2** | 10 | **4** | 23 | **2** | 20 | **3** | 19 | **6** | 18 | **7** | 12 | **4** | 144 | **51** | 35.42 |
| 1893 | 23 | **3** | 6 | **1** | 7 | **2** | 11 | **1** | 11 | **3** | 6 | **3** | 26 | **11** | 28 | **5** | 12 | **3** | 18 | **6** | 24 | **6** | 25 | **6** | 197 | **50** | 25.38 |
| 1894 | 50 | **14** | 29 | **7** | 30 | **5** | 13 | **7** | 8 | **6** | 11 | **4** | 12 | **7** | 30 | **3** | 25 | **4** | 21 | **5** | 20 | **6** | 9 | **2** | 258 | **70** | 27.13 |
| 1895 | 10 | .. | 16 | **3** | 6 | **1** | 13 | **1** | 7 | **4** | 11 | **3** | 3 | **1** | 16 | **3** | 14 | **4** | 17 | **8** | 50 | **6** | 64 | **12** | 227 | **46** | 20.26 |
| 1896 | 18 | **4** | 8 | **1** | 6 | **4** | 5 | **1** | 7 | **1** | 11 | **3** | 15 | **6** | 24 | **6** | 24 | **4** | 13 | **5** | 23 | **1** | 8 | **4** | 162 | **40** | 24.69 |
| 1897 | 10 | **2** | 5 | **2** | 4 | .. | 6 | **2** | 6 | .. | 3 | .. | 2 | .. | 9 | .. | 22 | **2** | 18 | **3** | 16 | **6** | 6 | **7** | 107 | **24** | 22.42 |
| 1898 | 13 | **3** | 11 | **4** | 15 | **2** | 8 | **4** | 5 | **3** | 4 | .. | 18 | **4** | 14 | **4** | 23 | **3** | 12 | **9** | 25 | **1** | 15 | **2** | 163 | **39** | 23.92 |
| 1899 | 2 | **1** | 3 | .. | 3 | **1** | 4 | **1** | 8 | **3** | 11 | **2** | 12 | **2** | 25 | **5** | 28 | **9** | 21 | **4** | 22 | **7** | 11 | **7** | 150 | **42** | 28.00 |
| 1900 | 2 | **4** | 8 | **1** | 10 | **5** | 2 | .. | 7 | **3** | 9 | **8** | 6 | **2** | 9 | **1** | 48 | **2** | 66 | **2** | 20 | **5** | 26 | **8** | 213 | **41** | 19.25 |
| 1901 | 8 | **6** | 9 | **2** | 11 | **6** | 7 | **1** | 7 | **1** | 8 | **1** | 4 | **4** | 5 | **2** | 24 | **5** | 29 | **7** | 35 | **3** | 21 | **9** | 168 | **47** | 27.97 |
| 1902 | 3 | **2** | 5 | **3** | 2 | **2** | 5 | **1** | 10 | **3** | 9 | **2** | 10 | **2** | 15 | **1** | 29 | **4** | 39 | **6** | 19 | **4** | 14 | **6** | 160 | **36** | 22.50 |
| 1903 | 4 | **4** | 3 | .. | 9 | **2** | 14 | **2** | 11 | **6** | 6 | **2** | 15 | **7** | 14 | **2** | 17 | **2** | 29 | **5** | 28 | [illegible] | 14 | **3** | 164 | **37** | 22.56 |
| 1904 | 5 | **1** | 6 | **3** | 5 | **2** | 4 | **2** | 2 | **2** | 6 | **3** | 5 | .. | 19 | **5** | 11 | **3** | 17 | **4** | 20 | .. | 6 | **3** | 106 | **28** | 26.41 |
| 1905 | 4 | **3** | 4 | .. | 5 | **3** | 10 | **1** | 8 | **1** | 8 | **1** | 32 | **2** | 28 | **7** | 22 | **5** | 26 | **6** | 21 | **3** | 11 | **3** | 179 | **35** | 19.55 |
| 1906 | 3 | **2** | 9 | **4** | 5 | **2** | 10 | **4** | 18 | **1** | 11 | **3** | 44 | **1** | 58 | **4** | 23 | **2** | 11 | **1** | 30 | **4** | 14 | **11** | 236 | **39** | 16.52 |
| 1907 | 15 | **1** | 9 | .. | 3 | .. | 8 | **2** | 5 | .. | 10 | .. | 4 | **2** | 15 | **1** | 25 | **5** | 11 | **4** | 14 | **1** | 6 | .. | 125 | **16** | 12.80 |
| 1908 | 8 | **3** | 10 | **1** | 5 | **1** | 58 | **3** | 73 | **7** | 15 | **2** | 13 | **1** | 15 | **1** | 37 | **3** | 12 | **3** | 40 | **3** | 19 | **7** | 305 | **35** | 11.47 |
| 1909 | 6 | **2** | 4 | .. | 3 | .. | 10 | .. | 5 | .. | 6 | **1** | 20 | **4** | 41 | **2** | 41 | **7** | 26 | **5** | 7 | **3** | 10 | **1** | 179 | **25** | 13.96 |
| Totals | 263 | **93** | 186 | **57** | 182 | **66** | 236 | **61** | 234 | **69** | 168 | **53** | 279 | **70** | 456 | **92** | 573 | **108** | 542 | **131** | 765 | **129** | 500 | **171** | 4,506 | **1,152** | 25.56 |

Of the typhoid fever reported in the city during the year, 18 cases were probably contracted outside of the city. Of these 6 were contracted at Jefferson, Mass., during a milk outbreak which was carefully investigated by the Massachusetts State Board of Health.

There were 36 cases treated in the hospitals of the city which are not included in the *cases* in the above table, for they lived out of the city and contracted the disease out of the city. 10 of these cases died, and the deaths are included in the deaths in the above table, for they must, according to present custom, be included in all tables in the registration report, and it would only result in confusion if they were omitted from this table.

The death rate from typhoid fever in Providence, leaving out the out-of-town cases, was 7 per 100,000 living, and the case fatality was 9.3.

There were 8 families with 2 cases each, 6 with 3 cases, and 1 with 4 cases. Most of these were instances of contact infection.

Two nurses and one orderly contracted the disease while caring for typhoid patients.

In order to study the relation of typhoid fever to different possible causes, it is desirable to show the seasonal distribution of the disease. This is best shown at present by tabulating the cases according to the date of going to bed, or in the few walking cases that are reported, the date of the first symptoms. This is shown for the last six years in the following table. All cases which were pretty certainly contracted outside of the city, and all cases due to milk infection are excluded from the table. In the report for 1903, page 53, was printed a diagram showing the seasonal distribution of typhoid fever by weeks for a number of years, but milk and water cases, and those contracted out of the city were included.

## TABLE XII.

### TYPHOID FEVER.

1904-1909.

Date of Going to Bed of Cases Contracted in Providence,

| DATE. | No. of Cases. | | | DATE. | No. of Cases. | | |
|---|---|---|---|---|---|---|---|
| | 1904-8. | 1909. | 1904-9. | | 1904-8. | 1909. | 1904-9. |
| Jan. 1- 7 | 14 | 2 | 16 | July 2- 8 | 14 | 2 | 16 |
| " 8-14 | 4 | ...... | 4 | " 9-15 | 14 | 3 | 17 |
| " 15-21 | 10 | 1 | 11 | " 16-22 | 17 | ...... | 17 |
| " 22-28 | 6 | 2 | 8 | " 23-29 | 21 | 13 | 34 |
| " 29-Feb. 4 | 5 | 1 | 6 | " 30-Aug. 5 | 15 | 12 | 27 |
| Feb. 5-11 | 8 | 1 | 9 | Aug. 6-12 | 22 | 9 | 31 |
| " 12-18 | 12 | 1 | 13 | " 13-19 | 27 | 9 | 36 |
| " 19-25 | 6 | 2 | 8 | " 20-26 | 24 | 4 | 28 |
| " 26-Mar. 4 | 6 | ...... | 6 | " 27-Sept. 2 | 30 | 6 | 36 |
| Mar. 5-11 | 5 | ...... | 5 | Sept. 3- 9 | 32 | 10 | 42 |
| " 12-18 | 8 | 2 | 10 | " 10-16 | 30 | 6 | 36 |
| " 19-25 | 2 | 1 | 3 | " 17-23 | 26 | 9 | 35 |
| " 26-Apr. 1 | 6 | 2 | 8 | " 24-30 | 14 | 6 | 20 |
| Apr. 2- 8 | 9 | 2 | 11 | Oct. 1- 7 | 20 | 6 | 26 |
| " 9-15 | 16 | 3 | 19 | " 8-14 | 19 | 9 | 28 |
| " 16-22 | 5 | 1 | 6 | " 15-21 | 15 | 2 | 17 |
| " 23-29 | 10 | 3 | 13 | " 22-28 | 24 | 1 | 25 |
| " 30-May 6 | 10 | 1 | 11 | " 29-Nov. 4 | 19 | 2 | 21 |
| May 7-13 | 7 | 2 | 9 | Nov. 5-11 | 18 | 3 | 21 |
| " 14-20 | 8 | 1 | 9 | " 12-18 | 25 | 2 | 27 |
| " 21-27 | 11 | ...... | 11 | " 19-25 | 29 | 1 | 30 |
| " 28-June 3 | 9 | ...... | 9 | " 26-Dec. 2 | 17 | 1 | 18 |
| June 4-10 | 10 | 1 | 11 | Dec. 3- 9 | 18 | 3 | 21 |
| " 11-17 | 15 | 1 | 16 | " 10-16 | 10 | 3 | 13 |
| " 18-24 | 9 | 3 | 12 | " 17-23 | 12 | 4 | 16 |
| " 25-July 1 | 16 | 1 | 17 | " 24-30 | 7 | 1 | 8 |
| | | | | " 31 | 1 | ...... | 1 |
| | | | | | 747 | 161 | 908 |

## DIPHTHERIA.

Besides the cases which were recorded as diphtheria there were 5 deaths reported as due to membranous croup.

During the year diphtheria was reported in 472 families. In 190 cultures for diagnosis were taken by the attending physician. This was 40.25 per cent. The year before it was 65 per cent. Of the 639 cases, 519 were from families in which diphtheria bacilli were found at some period of the disease, though no cultures were taken for diagnosis.

In 1909 there were examined by the State laboratory 1,644, by the city, 2,512, and by the hospital laboratory, 5,115 cultures. Total, 9,271 cultures. Cultures were taken from 173 scarlet fever cases, 11 at their homes, and 162 at the hospital. Of the latter, 12 showed diphtheria bacilli, of the former, 1; the others were negative.

Except in Tables XVI and XVII, the cases in which the diagnosis depended on clinical signs alone, are reckoned as diphtheria, and are included in the tables.

The following table shows the cases and deaths from diphtheria for each month for the last twenty-five years, and the case fatality during the last twenty-six years:

## TABLE XIII. DIPHTHERIA.

| YEAR. | JAN. |  | FEB. |  | MAR. |  | APRIL. |  | MAY. |  | JUNE. |  | JULY. |  | AUG. |  | SEPT. |  | OCT. |  | NOV. |  | DEC. |  | Total Cases. | Total Deaths. | Case Fatality. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. |  |  |  |
| 1884 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 193 | 58 | 30.05 |
| 1885 | 29 | 6 | 15 | 3 | 10 | .. | 5 | 1 | 5 | 2 | 5 | .. | 5 | 4 | 3 | 3 | 5 | 3 | 16 | 3 | 22 | 3 | 38 | 8 | 158 | 36 | 22.78 |
| 1886 | 25 | 4 | 33 | 7 | 19 | 6 | 12 | 8 | 27 | 6 | 34 | 8 | 33 | 2 | 9 | 8 | 13 | 14 | 33 | 15 | 38 | 7 | 46 | 14 | 322 | 99 | 30.74 |
| 1887 | 34 | 11 | 19 | 8 | 11 | 2 | 25 | 7 | 14 | 10 | 17 | 10 | 7 | 4 | 14 | 9 | 43 | 15 | 50 | 13 | 38 | 12 | 32 | 8 | 304 | 109 | 35.85 |
| 1888 | 33 | 9 | 20 | 5 | 25 | 14 | 16 | 5 | 20 | 6 | 6 | 4 | 8 | 8 | 7 | 3 | 14 | 4 | 25 | 12 | 28 | 9 | 28 | 18 | 230 | 97 | 42.17 |
| 1889 | 34 | 10 | 19 | 7 | 27 | 10 | 18 | 5 | 19 | 14 | 21 | 4 | 22 | 8 | 19 | 5 | 25 | 9 | 47 | 8 | 25 | 6 | 27 | 11 | 303 | 97 | 32.01 |
| 1890 | 42 | 17 | 42 | 15 | 36 | 7 | 22 | 9 | 23 | 7 | 21 | 4 | 13 | 6 | 33 | 8 | 12 | 6 | 14 | 7 | 15 | 3 | 28 | 5 | 301 | 94 | 31.22 |
| 1891 | 17 | 4 | 40 | 4 | 16 | 6 | 24 | 3 | 15 | 6 | 6 | 4 | 14 | 3 | 5 | 2 | 17 | 4 | 27 | 6 | 22 | 5 | 15 | 1 | 218 | 48 | 22.02 |
| 1892 | 1 | 1 | 3 | 5 | 25 | 4 | 12 | 3 | 14 | 4 | 17 | 3 | 6 | 3 | 5 | 1 | 3 | 2 | 18 | 4 | 20 | 4 | 14 | 5 | 138 | 39 | 28.26 |
| 1893 | 8 | 2 | 12 | 2 | 22 | 4 | 27 | 5 | 7 | 3 | 15 | 4 | 9 | 4 | 4 | 2 | 23 | 4 | 27 | 7 | 14 | 3 | 21 | 6 | 189 | 46 | 24.34 |
| 1894 | 15 | 5 | 11 | 3 | 7 | 6 | 18 | 4 | 24 | 6 | 20 | 7 | 2 | .. | 4 | .. | 11 | 2 | 14 | 3 | 17 | 5 | 23 | 4 | 166 | 45 | 27.11 |
| 1895 | 45 | 6 | 15 | 1 | 7 | 2 | 25 | 2 | 34 | 4 | 20 | 7 | 16 | 4 | 26 | 6 | 34 | 9 | 38 | 10 | 57 | 13 | 69 | 15 | 386 | 79 | 20.46 |
| 1896 | 71 | 10 | 62 | 6 | 67 | 17 | 77 | 11 | 64 | 12 | 48 | 8 | 48 | 9 | 31 | 4 | 57 | 9 | 108 | 16 | 137 | 16 | 120 | 7 | 890 | 125 | 14.04 |
| 1897 | 82 | 8 | 68 | 7 | 72 | 10 | 66 | 6 | 56 | 9 | 43 | 7 | 14 | 4 | 20 | 5 | 29 | 1 | 70 | 4 | 76 | 11 | 38 | 6 | 634 | 78 | 12.30 |
| 1898 | 17 | 4 | 40 | 6 | 22 | 3 | 15 | 2 | 33 | 2 | 11 | 2 | 8 | .. | 6 | 1 | 29 | 4 | 34 | 4 | 44 | .. | 18 | 2 | 277 | 30 | 10 83 |
| 1899 | 15 | 2 | 22 | 2 | 18 | 3 | 16 | 3 | 13 | 5 | 7 | 2 | 9 | .. | 7 | 1 | 11 | .. | 19 | 4 | 23 | 2 | 38 | 9 | 198 | 33 | 16.66 |
| 1900 | 29 | 6 | 17 | 2 | 31 | 3 | 33 | 4 | 20 | 2 | 20 | 1 | 12 | 1 | 21 | 1 | 13 | 2 | 44 | 3 | 68 | 8 | 61 | 10 | 369 | 43 | 11.65 |
| 1901 | 47 | 8 | 66 | 5 | 70 | 6 | 32 | 3 | 64 | 5 | 58 | 9 | 26 | 4 | 19 | 6 | 28 | 3 | 50 | 6 | 92 | 8 | 48 | 4 | 600 | 67 | 11.16 |
| 1902 | 65 | 9 | 51 | 7 | 37 | 5 | 35 | 7 | 32 | 1 | 10 | 2 | 22 | 2 | 20 | 4 | 64 | 8 | 65 | 5 | 61 | 6 | 68 | 6 | 530 | 62 | 11.70 |
| 1903 | 40 | 5 | 29 | 2 | 36 | 8 | 41 | 4 | 44 | 6 | 72 | 7 | 43 | 12 | 51 | 2 | 62 | 7 | 76 | 3 | 113 | 8 | 99 | 10 | 706 | 74 | 10 48 |
| 1904 | 58 | 9 | 53 | 7 | 71 | 9 | 53 | 6 | 31 | 2 | 57 | 4 | 43 | 4 | 52 | 9 | 81 | 10 | 95 | 6 | 90 | 8 | 96 | 6 | 780 | 80 | 10.25 |
| 1905 | 58 | 9 | 49 | 5 | 60 | 3 | 43 | 6 | 54 | 5 | 26 | 1 | 25 | 6 | 45 | 6 | 32 | 1 | 79 | 6 | 42 | 3 | 49 | 10 | 562 | 61 | 10 85 |
| 1906 | 38 | 5 | 30 | 4 | 42 | 8 | 32 | 1 | 31 | 2 | 11 | 1 | 25 | 2 | 14 | 2 | 25 | 3 | 64 | 4 | 51 | 7 | 44 | 5 | 407 | 44 | 10.81 |
| 1907 | 55 | 6 | 53 | 8 | 73 | 1 | 45 | 8 | 43 | 2 | 54 | 4 | 36 | 6 | 16 | .. | 44 | 7 | 50 | 5 | 57 | 8 | 44 | 3 | 570 | 58 | 10.18 |
| 1908 | 76 | 7 | 48 | 7 | 66 | 5 | 58 | 5 | 60 | 7 | 63 | 7 | 32 | 4 | 42 | 2 | 87 | 9 | 147 | 8 | 103 | 6 | 135 | 11 | 917 | 78 | 8.51 |
| 1909 | 94 | 7 | 48 | 4 | 39 | 4 | 44 | 6 | 30 | .. | 39 | 4 | 23 | 2 | 32 | 3 | 49 | .. | 59 | 5 | 86 | 8 | 96 | 10 | 639 | 53 | 8.29 |
| Totals | 1,028 | 170 | 865 | 132 | 909 | 146 | 794 | 124 | 777 | 128 | 701 | 114 | 501 | 102 | 505 | 93 | 811 | 136 | 1,269 | 167 | 1,339 | 169 | 1,295 | 194 | 10,987 | 1,733 | 15.77 |

As was stated in my last report, in November, 1908, a physician was employed to administer antitoxin to the poor in cases where he was requested to do so by the attending physician. During the remainder of 1908, antitoxin was by him given to 22 persons sick with diphtheria, and to 11 other members of these families for purposes of immunization. During 1909 the figures were 119 persons injected for curative purposes, and 100 for immunization, making, for the whole period, 141 for treatment, and 111 for prevention. Fortunately, none of the patients died, and none of the immunized persons contracted the disease.

It is interesting and important to know the case fatality at different ages. This can be shown for the past twenty-one years, 1889 to 1908, and is as follows:

DIPHTHERIA, CASE FATALITY AT DIFFERENT AGES.

| | 1889–1908 | | | 1909. | | |
|---|---|---|---|---|---|---|
| AGES. | CASES. | DEATHS. | FATALITY. | CASES. | DEATHS. | FATALITY. |
| Under 1 year | 183 | 71 | 38.79 | 14 | 9 | 64.29 |
| 1 and under 2 | 447 | 180 | 40.27 | 44 | 10 | 22.73 |
| 2 " " 5 | 2202 | 566 | 25.70 | 144 | 18 | 12.50 |
| 5 " " 10 | 3016 | 364 | 12.07 | 216 | 11 | 5.09 |
| 10 " " 15 | 1250 | 61 | 4.88 | 86 | 3 | 3.49 |
| 15 " " 20 | 428 | 21 | 4.91 | 36 | 1 | 2.78 |
| 20 and over | 1215 | 34 | 2.79 | 83 | 1 | 1.20 |
| Total | 8741 | 1297 | 14.82 | 623 | 53 | 8.51 |

In the last report, the subject of "plural deaths" from diphtheria, including croup, was considered in the light of a possible index of the severity of the disease. While in former years with a high case fatality the percentage of plural deaths to total deaths reached 13.6, during the last 5 years the percentage has been 1.2, and in 1908 and 1909 there were no secondary or plural deaths in any family in which this disease appeared. This improvement is due in part no doubt to the increasing use of antitoxin, but in part also, I suspect, to a decreasing virulence of the bacillus.

Table XIV shows the number of days isolation has been maintained in diphtheria during the last six years. During this period the warning sign was removed when the attending physician certified that ten days had elapsed since the disappearance of the exudation from the last case in the family, or if there was no exudation, it was removed ten days after the beginning of the last sickness. This table does not include cases which died or were removed to the hospital. A few placards are removed before the ten days' limit, for I also terminate isolation at any time when two successive negative cultures can be obtained. But very few such release cultures are taken, and none of them are included in the table. The average period of isolation in Providence during the past six years has been 20.69 days, and 55.21 per cent have been released by the 21st day. During the period from 1896 to 1902, when isolation was terminated by cultures from all members of the family, the average duration of isolation was 24.78 days.

Table XV, page 63, shows the number and percentage of persons of different ages exposed to diphtheria who contracted it, and the number who did not. This table includes all placarded cases, whether cultures were taken or not. When I began to collect these facts in 1889, the inspector was not careful to obtain the age in every case, so that until 1890 only a portion of the cases are contained in the table, and it is only since 1893 that the facts in regard to all the adults in the family have been obtained. The number exposed means all the members of the family where the disease occurred. Cases in public institutions are not included in this table:

## TABLE XIV.

### DAY OF INITIAL SICKNESS ON WHICH ISOLATION WAS TERMINATED.

| DAY. | CASES. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1904. | 1905. | 1906. | 1907. | 1908. | 1909. | Total. | Percentage. |
| 10 | 1 | 3 | 1 | 1 | 1 | 1 | 8 | .49 |
| 11 | 4 | 6 | 2 | 3 | 7 | 5 | 27 | 1.66 |
| 12 | 5 | 2 | 3 | 2 | 7 | 5 | 24 | 1.48 |
| 13 | 13 | 3 | 9 | 6 | 13 | 8 | 52 | 3.20 |
| 14 | 16 | 9 | 7 | 10 | 24 | 20 | 86 | 5.30 |
| 15 | 19 | 25 | 23 | 21 | 43 | 30 | 161 | 9.92 |
| 16 | 28 | 14 | 5 | 19 | 48 | 27 | 141 | 8.68 |
| 17 | 34 | 17 | 9 | 12 | 47 | 21 | 140 | 8.63 |
| 18 | 39 | 17 | 15 | 20 | 40 | 26 | 157 | 9.67 |
| 19 | 25 | 13 | 15 | 20 | 29 | 24 | 126 | 7.76 |
| 20 | 18 | 16 | 17 | 19 | 31 | 10 | 111 | 6.84 |
| 21 | 14 | 9 | 9 | 12 | 15 | 15 | 74 | 4.56 |
| 22 | 17 | 11 | 5 | 14 | 16 | 14 | 77 | 4.74 |
| 23 | 17 | 11 | 5 | 4 | 11 | 6 | 54 | 3.33 |
| 24 | 21 | 10 | 4 | 9 | 6 | 6 | 56 | 3.45 |
| 25 | 12 | 9 | 2 | 7 | 9 | 10 | 49 | 3.02 |
| 26 | 7 | 3 | 3 | 3 | 3 | 6 | 25 | 1.54 |
| 27 | 12 | 1 | 2 | 5 | 8 | 4 | 32 | 1.97 |
| 28 | 5 | 2 | 1 | 8 | 7 | 3 | 26 | 1.60 |
| 29 | 8 | 1 | 1 | 3 | 4 | 1 | 18 | 1.11 |
| 30 | 10 | 2 | 2 | 3 | 5 | 6 | 28 | 1.73 |
| 31 | 6 | 2 | 5 | 0 | 3 | 2 | 18 | 1.11 |
| 32 | 7 | 2 | ...... | 1 | 2 | 5 | 17 | 1.05 |
| 33 | 2 | 2 | 4 | 2 | 1 | 2 | 13 | .80 |
| 34 | 5 | 2 | 2 | 1 | 2 | 3 | 15 | .92 |
| 35 | 2 | ...... | 1 | 1 | 2 | 4 | 10 | .62 |
| 36 | 4 | ...... | 1 | 2 | 0 | 3 | 10 | .62 |
| 37 | 4 | 1 | 0 | 2 | 3 | 1 | 11 | .68 |
| 38 | 3 | 1 | 1 | 1 | 2 | ...... | 8 | .55 |
| 39 | 1 | ...... | ...... | 2 | 1 | 1 | 5 | .31 |
| 40 | 1 | ...... | 1 | 1 | 0 | ...... | 3 | .18 |
| 41 | 0 | ...... | 1 | 1 | 1 | ...... | 3 | .18 |
| 42 | 1 | ...... | ...... | ...... | 2 | 1 | 4 | .25 |
| 43 | 1 | 1 | ...... | 1 | 0 | ...... | 3 | .18 |
| 44 | 1 | ...... | ...... | 1 | 1 | 3 | 6 | .36 |
| 45 | 1 | ...... | ...... | ...... | 1 | ...... | 2 | .12 |
| 46 | 1 | 1 | 2 | ...... | 2 | 1 | 7 | .43 |
| 47 | 0 | ...... | ...... | ...... | ...... | 1 | 1 | .06 |
| 48 | 0 | ...... | ...... | ...... | ...... | 2 | 2 | .12 |
| 49 | 0 | 1 | ...... | ...... | 1 | ...... | 2 | .12 |
| 50 | 0 | ...... | 1 | ...... | 1 | ...... | 2 | .12 |
| 51 | 1 | ...... | ...... | ...... | 0 | ...... | 1 | .06 |
| 52 | 0 | ...... | ...... | ...... | ...... | 1 | 1 | .06 |
| 53 | 1 | ...... | ...... | ...... | 1 | ...... | 2 | .12 |
| 54 | 1 | ...... | ...... | ...... | ...... | ...... | 1 | .06 |
| 55 | 0 | 1 | ...... | ...... | ...... | ...... | 1 | .06 |
| 56 | 0 | ...... | ...... | ...... | ...... | ...... | ...... | .......... |
| 57 | 0 | ...... | ...... | 1 | 1 | ...... | 2 | .12 |
| 58 | 0 | ...... | ...... | ...... | ...... | ...... | ...... | .......... |
| 59 | 0 | ...... | ...... | ...... | ...... | 1 | 1 | .06 |
| | 368 | 198 | 159 | 218 | 401 | 279 | 1,623 | 100.00 |

## TABLE XV.

### DIPHTHERIA.

| AGES. | CASES. | | | | | | | Totals. | NUMBER EXPOSED INCLUDING CASES. | | | | | | | Total. | Attack Rate. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1889-1895. | 1896-1900. | 1901-1905. | 1906. | 1907. | 1908. | 1909. | | 1889-1895. | 1896-1900. | 1901-1905. | 1906. | 1907. | 1908. | 1909. | | |
| Under 1 year.... | 42 | 46 | 63 | 11 | 10 | 11 | 14 | 197 | 189 | 252 | 370 | 63 | 63 | 127 | 75 | 1,139 | 17.29 |
| 1 " ... | 67 | 131 | 159 | 24 | 30 | 36 | 44 | 491 | 157 | 247 | 359 | 50 | 64 | 124 | 106 | 1,107 | 44.21 |
| 2 " .... | 142 | 181 | 238 | 29 | 41 | 59 | 45 | 738 | 230 | 264 | 452 | 57 | 81 | 135 | 92 | 1,311 | 56.29 |
| 3 " .... | 147 | 192 | 264 | 36 | 32 | 74 | 50 | 795 | 241 | 280 | 483 | 66 | 60 | 161 | 107 | 1,398 | 56.87 |
| 4 " .... | 150 | 211 | 266 | 23 | 45 | 69 | 49 | 813 | 239 | 309 | 474 | 53 | 88 | 151 | 118 | 1,432 | 56.77 |
| 5 " .... | 139 | 210 | 239 | 29 | 33 | 57 | 57 | 764 | 254 | 298 | 472 | 53 | 69 | 128 | 113 | 1,387 | 55.08 |
| 6 " .... | 114 | 193 | 248 | 40 | 46 | 91 | 43 | 775 | 219 | 284 | 467 | 78 | 83 | 179 | 105 | 1,415 | 54.77 |
| 7 " .... | 101 | 153 | 221 | 17 | 45 | 75 | 53 | 665 | 203 | 268 | 475 | 47 | 76 | 153 | 113 | 1,335 | 49.81 |
| 8 " .... | 98 | 138 | 170 | 28 | 35 | 69 | 27 | 565 | 199 | 261 | 405 | 54 | 79 | 158 | 87 | 1,243 | 45.45 |
| 9 " .... | 64 | 105 | 153 | 20 | 22 | 63 | 36 | 463 | 161 | 204 | 388 | 50 | 55 | 141 | 101 | 1,100 | 42.09 |
| 10 " .... | 65 | 93 | 105 | 16 | 16 | 47 | 29 | 371 | 150 | 215 | 342 | 53 | 63 | 106 | 72 | 1,001 | 37.06 |
| 11 " .... | 44 | 90 | 99 | 16 | 24 | 43 | 17 | 333 | 115 | 171 | 307 | 49 | 60 | 116 | 80 | 898 | 37.08 |
| 12 " .... | 70 | 66 | 77 | 11 | 13 | 30 | 18 | 285 | 149 | 190 | 280 | 46 | 48 | 94 | 76 | 883 | 32.28 |
| 13 " .... | 29 | 54 | 66 | 8 | 14 | 19 | 10 | 200 | 96 | 150 | 251 | 38 | 50 | 88 | 61 | 734 | 27.25 |
| 14 " .... | 26 | 37 | 45 | 3 | 11 | 13 | 12 | 147 | 82 | 144 | 221 | 29 | 38 | 82 | 50 | 646 | 22.75 |
| 15 " .... | 18 | 29 | 37 | 7 | 11 | 10 | 7 | 119 | 77 | 131 | 193 | 35 | 33 | 60 | 46 | 575 | 20.71 |
| 16 " .... | 18 | 23 | 29 | 4 | 11 | 8 | 12 | 105 | 81 | 113 | 180 | 22 | 38 | 53 | 40 | 527 | 19.92 |
| 17 " .... | 23 | 34 | 25 | 0 | 4 | 6 | 2 | 94 | 60 | 108 | 147 | 17 | 28 | 51 | 48 | 459 | 20.48 |
| 18 " ... | 17 | 12 | 23 | 2 | 9 | 7 | 9 | 79 | 55 | 97 | 162 | 29 | 33 | 51 | 50 | 477 | 16.56 |
| 19 " .... | 9 | 20 | 22 | 2 | 2 | 6 | 6 | 67 | 38 | 85 | 131 | 13 | 24 | 43 | 22 | 356 | 18.82 |
| 20 " .... | 12 | 20 | 28 | 6 | 7 | 3 | 3 | 79 | 31 | 81 | 124 | 16 | 18 | 30 | 32 | 332 | 23.79 |
| Adults........... | 244 | 278 | 395 | 61 | 83 | 78 | 80 | 1,219 | 2,038 | 3,951 | 5,604 | 679 | 1,042 | 1,725 | 1,272 | 16,311 | 7.47 |
| Totals ......... | 1,639 | 2,316 | 2,972 | 393 | 547 | 874 | 623 | 9,364 | 5,064 | 8,103 | 12,287 | 1,597 | 2,193 | 3,956 | 2,866 | 36,066 | 25.96 |

## TABLE XVI.

### CASES FROM FAMILIES WHERE DIPHTHERIA BACILLI WERE FOUND.

| Ages. | Cases. | | | | | | | Number Exposed, Including Cases. | | | | | | | Attack Rates. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1896-1908 | | 1909. | | Total. | | Totals. | 1896-1908. | | 1909. | | Totals. | | Totals. | | | Totals. |
| | M. | F. | M. | F. | M. | F. | | M. | F. | M. | F. | M. | F. | | M. | F. | |
| Under 1 year... | 50 | 46 | 7 | 5 | 57 | 51 | 108 | 317 | 309 | 36 | 29 | 353 | 338 | 691 | 14.4 | 15.1 | 15.6 |
| 1 " .. | 139 | 132 | 17 | 12 | 156 | 144 | 300 | 311 | 303 | 46 | 32 | 357 | 335 | 692 | 43.7 | 43.0 | 43.4 |
| 2 years.. | 222 | 204 | 18 | 16 | 240 | 220 | 460 | 368 | 355 | 40 | 34 | 408 | 389 | 797 | 58.8 | 56.6 | 57.7 |
| 3 " .. | 197 | 204 | 22 | 20 | 219 | 224 | 443 | 382 | 390 | 40 | 47 | 422 | 437 | 859 | 51.9 | 51.3 | 51.6 |
| 4 " .. | 226 | 227 | 23 | 18 | 249 | 245 | 494 | 415 | 422 | 49 | 47 | 464 | 469 | 933 | 53.7 | 52.2 | 52.9 |
| 5 " .. | 218 | 216 | 29 | 17 | 247 | 233 | 480 | 419 | 399 | 49 | 40 | 468 | 439 | 907 | 52.8 | 53.1 | 52 9 |
| 6 " .. | 213 | 249 | 12 | 23 | 225 | 272 | 497 | 401 | 456 | 32 | 54 | 433 | 510 | 943 | 52.0 | 53.3 | 52.7 |
| 7 " .. | 184 | 205 | 17 | 27 | 201 | 232 | 433 | 393 | 396 | 36 | 56 | 429 | 452 | 881 | 46.9 | 51.3 | 49.0 |
| 8 " .. | 167 | 204 | 8 | 11 | 175 | 215 | 390 | 375 | 399 | 32 | 34 | 407 | 433 | 840 | 43.0 | 49.7 | 46.4 |
| 9 " .. | 149 | 147 | 13 | 19 | 162 | 166 | 328 | 326 | 328 | 37 | 47 | 363 | 375 | 738 | 44.6 | 44.3 | 44.4 |
| 10 " .. | 103 | 130 | 11 | 14 | 114 | 144 | 258 | 315 | 291 | 29 | 32 | 344 | 323 | 667 | 33.1 | 44.6 | 38.7 |
| 11 " .. | 96 | 112 | 5 | 7 | 101 | 119 | 220 | 275 | 284 | 41 | 22 | 316 | 306 | 622 | 32.0 | 38.8 | 35.4 |
| 12 " .. | 63 | 100 | 7 | 9 | 70 | 109 | 179 | 262 | 242 | 31 | 35 | 293 | 277 | 570 | 23.9 | 39.3 | 31.4 |
| 13 " .. | 61 | 67 | 5 | 3 | 66 | 70 | 136 | 218 | 233 | 33 | 18 | 251 | 251 | 502 | 26.3 | 27.9 | 27.1 |
| 14 " .. | 43 | 46 | 8 | 2 | 51 | 48 | 99 | 197 | 199 | 25 | 12 | 222 | 211 | 433 | 23.0 | 22.7 | 22.9 |
| 15 " .. | 27 | 50 | 1 | 4 | 28 | 54 | 82 | 155 | 176 | 19 | 20 | 174 | 196 | 370 | 16.1 | 27.6 | 22.2 |
| 16 " .. | 41 | 27 | 1 | 6 | 42 | 33 | 75 | 166 | 133 | 8 | 20 | 174 | 153 | 327 | 24.1 | 21.6 | 22.9 |
| 17 " .. | 19 | 41 | 0 | 0 | 19 | 41 | 60 | 122 | 143 | 18 | 18 | 140 | 161 | 301 | 13.6 | 25.5 | 19.9 |
| 18 " .. | 18 | 21 | 2 | 5 | 20 | 26 | 46 | 129 | 136 | 19 | 20 | 148 | 156 | 304 | 13.5 | 16.7 | 15.1 |
| 19 " .. | 16 | 22 | 3 | 3 | 19 | 25 | 44 | 114 | 105 | 10 | 8 | 124 | 113 | 237 | 15.3 | 22.1 | 18.6 |
| 20 " .. | 19 | 28 | 1 | 1 | 20 | 29 | 49 | 90 | 104 | 12 | 14 | 102 | 118 | 220 | 19.6 | 24.6 | 22.3 |
| Adults......... | 231 | 488 | 20 | 51 | 251 | 539 | 790 | 4284 | 4941 | 443 | 557 | 4727 | 5498 | 10225 | 5.3 | 9.8 | 7.1 |
| Totals....... | 2502 | 2966 | 230 | 273 | 2732 | 3239 | 5971 | 10034 | 10744 | 1085 | 1196 | 11119 | 11940 | 23059 | 24.6 | 27.1 | 25.9 |

## TABLE XVII.

### Diphtheria, 1896–1909.

CASES FROM FAMILIES WHERE DIPHTHERIA BACILLI WERE FOUND.

AGE AND SEX OF PRIMARY CASE AND SUBSEQUENT CASES.

| AGES. | Primary Cases. | | | | | | Secondary Cases. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M. | Attack Rate. | F. | Attack Rate. | Total M. and F. | Attack Rate. | M. | Attack Rate. | F. | Attack Rate. | Total M. and F. | Attack Rate. |
| Under 1 year......... | 33 | 9.3 | 30 | 8.9 | 63 | 9.1 | 24 | 7.5 | 21 | 6.8 | 45 | 7.2 |
| 1 " ......... | 103 | 28.9 | 83 | 25.1 | 186 | 27.0 | 53 | 20.9 | 61 | 24.3 | 114 | 22.6 |
| 2 years....... | 164 | 40.2 | 133 | 34.2 | 297 | 37.3 | 76 | 31.1 | 87 | 33.9 | 163 | 32.6 |
| 3 " ........ | 140 | 33.2 | 135 | 30.9 | 275 | 32.0 | 79 | 28.0 | 89 | 29.5 | 168 | 28.8 |
| 4 " ........ | 170 | 36.6 | 170 | 36.2 | 340 | 36.4 | 79 | 26.9 | 75 | 25.1 | 154 | 26.0 |
| 5 " ........ | 178 | 38.0 | 163 | 37.1 | 341 | 37.6 | 69 | 23.8 | 70 | 25.4 | 139 | 24.6 |
| 6 " ...... | 162 | 37.4 | 206 | 40.4 | 368 | 39.0 | 63 | 23.2 | 66 | 21.7 | 129 | 22.4 |
| 7 " ........ | 158 | 36.8 | 175 | 38.7 | 333 | 37.8 | 43 | 15.9 | 57 | 20.6 | 100 | 18.2 |
| 8 " ........ | 122 | 30.0 | 159 | 36.7 | 281 | 33.5 | 53 | 18.6 | 56 | 20.4 | 109 | 19.5 |
| 9 " ........ | 115 | 31.7 | 113 | 30.1 | 228 | 30.9 | 47 | 18.9 | 53 | 20.2 | 100 | 19.6 |
| 10 " ........ | 84 | 24.4 | 103 | 31.9 | 187 | 28.0 | 30 | 11.5 | 41 | 18.6 | 71 | 14.8 |
| 11 " ........ | 66 | 21.1 | 76 | 24.8 | 142 | 22.8 | 35 | 14.0 | 43 | 18.7 | 78 | 16.2 |
| 12 " ........ | 51 | 17.4 | 76 | 27.4 | 127 | 22.3 | 19 | 7.9 | 33 | 16.4 | 52 | 11.7 |
| 13 " ........ | 46 | 18.4 | 43 | 17.1 | 89 | 17.7 | 20 | 9.8 | 27 | 13.0 | 47 | 11.4 |
| 14 " ........ | 34 | 15.3 | 36 | 17.1 | 70 | 16.2 | 17 | 9.0 | 12 | 6.9 | 29 | 8.0 |
| 15 " ........ | 19 | 10.9 | 35 | 17.8 | 54 | 14.7 | 9 | 5.8 | 19 | 11.8 | 28 | 8.9 |
| 16 " ........ | 31 | 17.8 | 23 | 15.0 | 54 | 16.5 | 11 | 7.7 | 10 | 7.7 | 21 | 7.7 |
| 17 " ........ | 11 | 7.8 | 25 | 15.5 | 36 | 11.9 | 8 | 6.2 | 16 | 11.8 | 24 | 9.1 |
| 18 " ....... | 14 | 9.4 | 17 | 10.9 | 31 | 10.2 | 6 | 4.5 | 9 | 6.5 | 15 | 5.5 |
| 19 " ........ | 15 | 12.1 | 18 | 15.9 | 33 | 13.9 | 4 | 3.7 | 7 | 7.4 | 11 | 5.4 |
| 20 " ........ | 15 | 14.7 | 20 | 17.0 | 35 | 15.9 | 5 | 5.7 | 9 | 10.2 | 14 | 7.6 |
| Adults.................. | 169 | 3.6 | 284 | 5.2 | 453 | 4.4 | 82 | 1.8 | 255 | 4.9 | 337 | 3.4 |
| Totals............... | 1,900 | 17.1 | 2,123 | 17.8 | 4,023 | 17.4 | 832 | 9.0 | 1,116 | 11.3 | 1,948 | 10.2 |

In tables XV, XVI, and XVII all of the families have been included in the tabulation regardless of whether the patients were removed to the hospital, or well members of the family went away to live during the sickness. It has seemed best to prepare another table, Table XVIII, which should not include any family where there was a death, or where a patient was removed to the hospital. Also in this table none of the persons who were promptly removed from the house are included among the "exposed." This table is prepared to show what are the chances of the extension of the disease in those families where the patient lives and remains at home. This table includes the cases which were reported as diphtheria, whether or not diphtheria bacilli were found to be present. It covers the years 1904-1909. Unfortunately, the figures are not large enough to prevent considerable irregularity in the curve of age distribution of the cases, but this will, doubtless, smooth out in future years. As was to have been expected the apparent attack rate for secondary cases is higher than in the two preceding tables, partly because owing to the conditions there were doubtless more secondary cases, and partly, but to a less extent, owing to the subtraction of the cases which were removed from home.

Besides the cases tabulated in Table XV, there were 16 cases in institutions occurring by months as follows, which are all included in Table XIII, which table includes all the cases occurring in the city of which this department has knowledge. The institution cases occurred by months as follows: Jan. 6, Feb. 1, April 1, May 1, July 1, Aug. 2, Sept. 1, Nov. 2, Dec. 1.

The next table, Table XVI, exhibits data similar to those in Table XV, except that in Table XVI the facts relate only to those families in which diphtheria bacilli were found. Furthermore, in this table distinction of sex is made, though it was not in the reports previous to 1905.

## TABLE XVIII.

### DIPHTHERIA 1904–1909.

ATTACK RATE IN FAMILIES IN WHICH THE PATIENT LIVED AND REMAINED AT HOME. THE WELL PERSONS WHO REMOVED FROM HOME NOT TABULATED.

| AGES. | Number exposed including cases. | Primary cases. | Attack rate. | Number exposed including cases after deducting Primary cases and those that went away from home. | Secondary cases. | Attack rate. | Total cases. | Attack rate. |
|---|---|---|---|---|---|---|---|---|
| Under 1 year | 264 | 18 | 6.81 | 246 | 8 | 3.25 | 26 | 9.85 |
| 1 " | 271 | 71 | 26.19 | 198 | 18 | 9.09 | 89 | 32.84 |
| 2 years | 310 | 90 | 29.03 | 220 | 42 | 19.09 | 132 | 42.58 |
| 3 " | 346 | 137 | 39.60 | 206 | 37 | 17.96 | 174 | 50.29 |
| 4 " | 366 | 138 | 37.70 | 223 | 38 | 17.04 | 176 | 40.89 |
| 5 " | 300 | 120 | 40.00 | 178 | 30 | 16.85 | 150 | 50.00 |
| 6 " | 390 | 167 | 42.82 | 219 | 44 | 20.09 | 211 | 54.10 |
| 7 " | 357 | 168 | 47.06 | 186 | 26 | 13.98 | 194 | 54.34 |
| 8 " | 321 | 113 | 35.20 | 203 | 27 | 13.30 | 140 | 43.61 |
| 9 " | 319 | 119 | 37.30 | 196 | 29 | 14.80 | 148 | 46.39 |
| 10 " | 305 | 96 | 31.48 | 207 | 18 | 8.70 | 114 | 37.38 |
| 11 " | 258 | 68 | 26.36 | 185 | 26 | 14.05 | 94 | 36.43 |
| 12 " | 236 | 63 | 26.69 | 170 | 18 | 10.59 | 81 | 34.32 |
| 13 " | 210 | 29 | 13.81 | 178 | 13 | 7.30 | 42 | 20.00 |
| 14 " | 185 | 33 | 17.84 | 146 | 13 | 8.90 | 46 | 24.87 |
| 15 " | 191 | 30 | 15.71 | 157 | 11 | 7.01 | 41 | 21.47 |
| 16 " | 152 | 29 | 19.08 | 122 | 9 | 7.38 | 38 | 25.00 |
| 17 " | 120 | 10 | 8.33 | 108 | 2 | 1.85 | 12 | 10.00 |
| 18 " | 146 | 18 | 12.33 | 127 | 3 | 2.36 | 21 | 14.38 |
| 19 " | 119 | 18 | 15.13 | 100 | 4 | 4.00 | 22 | 18.49 |
| 20 " | 98 | 14 | 14.29 | 83 | 2 | 2.41 | 16 | 16.33 |
| Adults | 4,349 | 180 | 4.14 | 4,156 | 96 | 2.31 | 276 | 6.35 |
| Total | 9,613 | 1,729 | 17.99 | 7,814 | 514 | 6.58 | 2,243 | 23.33 |

Table XVII shows the same facts, at the same time making a distinction between primary and subsequent cases. As was to be expected, the difference between male and female infection is not so marked among the primary as among the secondary cases. Thus of the primary cases the percentage of those exposed is 3.6 for males of 21 years and over, and 5.2 for females, while for secondary cases in the family the percentages are 1.8 and 4.9. After the disease is recognized the men in the family usually try to keep away from the sickness as much as possible, while the women are brought into the closest contact with the patients. Between the ages of 12 and 20 the ratio of cases to exposures is for primary cases 16.2 for males and 19.9 for females; for subsequent cases 8.1 for males and 12.0 for females. Below the age of 12 years the attack rates for primary cases are for males 34.8, females, 35.7; for secondary cases they are for males, 23.2, and for females, 25.8.

The "number exposed" always includes the "cases." The number on which the rate for secondary cases is calculated is the total number exposed less the primary cases. The "number exposed" on which the rates in Table XVII are calculated are given in Table XVI.

I am frequently asked the number of cases in the city. The number of placarded houses, that is, the number of infected families, is always on record, but the secondary cases in the families are not always promptly reported. If the number of infected houses be multiplied by 1.48 it will give approximately the number of cases. The factor 1.48 is found by dividing the total number of cases given in Table XVII by the primary cases.

I have also prepared another table, Table XIX, for the years 1895-1909, which includes only those families in which domestic servants were employed, or in which a special nurse was provided for the patient. It seemed likely that the isolation of the patient from the family would be much better in such families than in families without servants or nurses. If so, one would expect a smaller proportion of cases than in the average family. As the table shows, the secondary attack rate is appreciably less than in Table XVII, with which it is directly comparable. Among children up to 12 years (inclusive) the secondary attack rate was 15.59 in families employing nurses or servants, while in the average family as represented in Table XVII, the rate was 26.54. It is rather surprising, however, to find that the attack rate of adult females in the families with servants is almost as high as in the average family, and including servants it is higher, and the attack rate for adult males in the families with servants also is higher.

It is also worthy of note that of 218 servants, 5 were attacked, of whom 4 were primary cases, which shows that the chance of a servant girl living in an infected family contracting diphtheria is only 1 in 214. As a matter of fact, every member of the family, including the servant, in this particular case contracted the disease. Of 154 nurses only 2 contracted diphtheria.

# TABLE XIX.

## Diphtheria, 1895–1909.

### PERCENTAGE ATTACKED IN FAMILIES EMPLOYING SERVANTS OR NURSES.

| Ages. | Primary. | | | | | | | | | Secondary. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Males. | | | Females. | | | Total. | | | Males. | | | Females. | | | Total. | | |
| | No. exposed including cases. | Cases. | Per cent. | No. exposed including cases. | Cases. | Per cent. | No. exposed including cases. | Cases. | Per cent. | No. exposed including cases. | Cases. | Per cent. | No. exposed including cases. | Cases. | Per cent. | No. exposed including cases. | Cases. | Per cent. |
| Under 1 year... | 22 | 0 | ...... | 24 | 0 | ...... | 46 | 0 | ...... | 22 | 1 | 4.54 | 24 | 0 | ...... | 46 | 1 | 2.17 |
| 1 " .. | 9 | 1 | 11.11 | 16 | 2 | 12.50 | 25 | 3 | 12.00 | 8 | 2 | 25.00 | 14 | 0 | ...... | 22 | 2 | 9.09 |
| 2 years.. | 20 | 7 | 35.00 | 17 | 6 | 35.29 | 37 | 13 | 35.13 | 13 | 2 | 15.38 | 11 | 4 | 36.36 | 24 | 6 | 25.00 |
| 3 " .. | 26 | 8 | 30.77 | 18 | 6 | 33.33 | 44 | 14 | 31.82 | 18 | 7 | 38.88 | 12 | 1 | 8.33 | 30 | 8 | 26.66 |
| 4 " .. | 19 | 6 | 31.57 | 16 | 10 | 62.50 | 35 | 16 | 45.71 | 13 | 2 | 15.38 | 6 | 0 | ...... | 19 | 2 | 10.52 |
| 5 " .. | 21 | 13 | 61.90 | 19 | 5 | 26.32 | 40 | 18 | 45.00 | 8 | 1 | 12.50 | 14 | 3 | 21.43 | 22 | 4 | 18.18 |
| 6 " .. | 22 | 9 | 40.91 | 32 | 16 | 50.00 | 54 | 25 | 46.30 | 13 | 3 | 23.09 | 16 | 2 | 12.50 | 29 | 5 | 17.24 |
| 7 " .. | 28 | 9 | 32.14 | 37 | 18 | 48.65 | 65 | 27 | 41.54 | 19 | 4 | 21.05 | 19 | 2 | 10.52 | 38 | 6 | 15.79 |
| 8 " .. | 19 | 8 | 42.10 | 16 | 6 | 37.50 | 35 | 14 | 40.00 | 11 | 0 | ...... | 10 | 3 | 30.00 | 21 | 3 | 14.29 |
| 9 " . | 20 | 8 | 40.00 | 21 | 11 | 52.38 | 41 | 19 | 46.34 | 12 | 3 | 25.00 | 10 | 3 | 30.00 | 22 | 6 | 27.27 |
| 10 " .. | 17 | 5 | 29.41 | 16 | 5 | 31.25 | 33 | 10 | 30.30 | 12 | 0 | ...... | 11 | 2 | 18.18 | 23 | 2 | 8.70 |
| 11 " .. | 16 | 8 | 50.00 | 17 | 3 | 17.65 | 33 | 11 | 33.33 | 8 | 1 | 12.50 | 14 | 4 | 28.57 | 22 | 5 | 22.72 |
| 12 " .. | 11 | 4 | 36.36 | 19 | 4 | 21.05 | 30 | 8 | 26.66 | 7 | 1 | 14.29 | 15 | 2 | 13.33 | 22 | 3 | 13.63 |
| 13 " .. | 9 | 3 | 33.33 | 11 | 3 | 27.27 | 20 | 6 | 30.00 | 6 | 0 | ...... | 8 | 0 | ...... | 14 | 0 | ...... |
| 14 " .. | 9 | 1 | 1.11 | 8 | 2 | 25.00 | 17 | 3 | 17.65 | 8 | 1 | 12.50 | 6 | 0 | ...... | 14 | 1 | 7.14 |
| 15 " .. | 10 | 1 | 1.00 | 11 | 2 | 18.18 | 21 | 3 | 14.29 | 9 | 1 | 11.11 | 9 | 3 | 33.33 | 18 | 4 | 22.22 |
| 16 " .. | 14 | 3 | 21.43 | 7 | 3 | 42.85 | 21 | 6 | 28.57 | 11 | 0 | ...... | 4 | 0 | ...... | 15 | 0 | ...... |
| 17 " .. | 5 | 1 | 20.00 | 7 | 0 | ...... | 12 | 1 | 8.33 | 4 | 0 | ...... | 7 | 0 | ...... | 11 | 0 | ...... |
| 18 " .. | 9 | 1 | 1.11 | 9 | 1 | 11.11 | 18 | 2 | 11.11 | 8 | 0 | ...... | 8 | 0 | ...... | 16 | 0 | ...... |
| 19 " .. | 5 | 2 | 40.00 | 3 | 0 | ...... | 8 | 2 | 25.00 | 3 | 0 | ...... | 3 | 0 | ...... | 6 | 0 | ...... |
| 20 " .. | 6 | 1 | 16.66 | 4 | 2 | 50.00 | 10 | 3 | 30.00 | 5 | 0 | ...... | 2 | 1 | 5.00 | 7 | 1 | 14.29 |
| Adults......... | 342 | 17 | 4.97 | 787 | 51 | 6.48 | 1,129 | 68 | 6.02 | 325 | 11 | 3.38 | 736 | 35 | 4.76 | 1,061 | 46 | 4.34 |
| Totals....... | 659 | 116 | 17.60 | 1,115 | 156 | 13.99 | 1,774 | 272 | 15.33 | 543 | 40 | 7.37 | 959 | 65 | 6.78 | 1,502 | 105 | 6.99 |

It is of interest to know when the secondary cases develop the disease. This is shown for the years 1904-9 in Table XX. This table includes all cases reported as diphtheria, although cultures may not have been taken. It appears that second cases are most likely to develop on the 2d and 3d days of the initial sickness, thus indicating a short period of incubation. 55.49 per cent develop during the first week, and 79.34 per cent during the first two weeks of the initial sickness. Subsequent cases of course occur somewhat later, and the day of greatest frequency for them is the 7th.

## TABLE XX.

### DIPHTHERIA, 1904-1909.

DAY OF INITIAL SICKNESS ON WHICH SECONDARY CASE OCCURRED.

| SECOND CASE. | | | | | | THIRD AND LATER CASES. | | | | | | ALL CASES SUBSEQUENT TO PRIMARY. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. |
| 1 | 46 | 6.65 | 38 | 2 | .29 | 1 | 3 | .74 | 38 | 0 | ...... | 1 | 49 | 4.45 | 38 | 2 | .18 |
| 2 | 74 | 10.69 | 39 | 0 | ...... | 2 | 12 | 2.95 | 39 | 3 | .74 | 2 | 86 | 7.83 | 39 | 3 | .27 |
| 3 | 72 | 10.40 | 40 | 1 | .15 | 3 | 18 | 4.42 | 40 | 2 | .49 | 3 | 90 | 8.19 | 40 | 3 | .27 |
| 4 | 48 | 6.93 | 41 | 0 | ...... | 4 | 13 | 3.19 | 41 | 2 | .49 | 4 | 61 | 5.55 | 41 | 2 | .18 |
| 5 | 47 | 6.79 | 42 | 0 | ...... | 5 | 25 | 6.14 | 42 | 0 | ...... | 5 | 72 | 6.55 | 42 | 0 | ...... |
| 6 | 46 | 6.65 | 43 | 2 | .29 | 6 | 26 | 6.39 | 43 | 1 | .24 | 6 | 72 | 6.55 | 43 | 3 | .27 |
| 7 | 51 | 7.37 | 44 | 0 | ...... | 7 | 31 | 7.62 | 44 | 0 | ...... | 7 | 82 | 7.46 | 44 | 0 | ...... |
| 8 | 51 | 7.37 | 45 | 1 | .15 | 8 | 22 | 5.41 | 45 | 2 | .49 | 8 | 73 | 6.64 | 45 | 3 | .27 |
| 9 | 27 | 3.90 | 46 | 2 | .29 | 9 | 16 | 3.93 | 46 | 0 | ...... | 9 | 43 | 3.91 | 46 | 2 | .18 |
| 10 | 24 | 3.46 | 47 | 2 | .29 | 10 | 14 | 3.44 | 47 | 0 | ...... | 10 | 38 | 3.46 | 47 | 2 | .18 |
| 11 | 23 | 3.32 | 48 | 0 | ...... | 11 | 19 | 4.67 | 48 | 1 | .24 | 11 | 42 | 3.82 | 48 | 1 | .09 |
| 12 | 18 | 2.60 | 49 | 0 | ...... | 12 | 11 | 2.70 | 49 | 1 | .24 | 12 | 29 | 2.64 | 49 | 1 | .09 |
| 13 | 14 | 2.02 | 50 | 0 | ...... | 13 | 14 | 3.44 | 50 | 2 | .49 | 13 | 28 | 2.55 | 50 | 2 | .18 |
| 14 | 8 | 1.15 | 51 | 1 | .15 | 14 | 8 | 1.97 | 51 | 1 | .24 | 14 | 16 | 1.46 | 51 | 2 | .18 |
| 15 | 20 | 2.89 | 52 | 0 | ...... | 15 | 12 | 2.95 | 52 | 0 | ...... | 15 | 32 | 2.91 | 52 | 0 | ...... |
| 16 | 6 | .87 | 53 | 0 | ...... | 16 | 9 | 2.21 | 53 | 0 | ...... | 16 | 15 | 1.36 | 53 | 0 | ...... |
| 17 | 7 | 1.01 | 54 | 2 | .29 | 17 | 8 | 1.97 | 54 | 0 | ...... | 17 | 15 | 1.36 | 54 | 2 | .18 |
| 18 | 7 | 1.01 | 55 | 0 | ...... | 18 | 15 | 3.69 | 55 | 0 | ...... | 18 | 22 | 2.00 | 55 | 0 | ...... |
| 19 | 8 | 1.15 | 56 | 0 | ...... | 19 | 11 | 2.70 | 56 | 1 | .24 | 19 | 19 | 1.73 | 56 | 1 | .09 |
| 20 | 4 | .57 | 9th wk. | 3 | .43 | 20 | 5 | 1.23 | 9th wk. | 5 | 1.23 | 20 | 9 | .82 | 9th wk. | 8 | .73 |
| 21 | 9 | 1.30 | 10 “ | 2 | .29 | 21 | 9 | 2.21 | 10 “ | 3 | .74 | 21 | 18 | 1.64 | 10 “ | 5 | .45 |
| 22 | 7 | 1.01 | 11 “ | 3 | .43 | 22 | 10 | 2.46 | 11 “ | 2 | .49 | 22 | 17 | 1.55 | 11 “ | 5 | .45 |
| 23 | 6 | .87 | 12 “ | 2 | .29 | 23 | 3 | .74 | 12 ‘ | 1 | .24 | 23 | 9 | .82 | 12 “ | 3 | .27 |
| 24 | 6 | .87 | 13 “ | 0 | ...... | 24 | 5 | 1.23 | 13 “ | 0 | ...... | 24 | 11 | 1.00 | 13 “ | 0 | ...... |
| 25 | 6 | .87 | 14 “ | 1 | .15 | 25 | 3 | .74 | 14 “ | 2 | .49 | 25 | 9 | .82 | 14 “ | 3 | .27 |
| 26 | 1 | .15 | 15 “ | 1 | .15 | 26 | 12 | 2.95 | 15 “ | 2 | .49 | 26 | 13 | 1.18 | 15 “ | 3 | .27 |
| 27 | 3 | .43 | 23 “ | 1 | .15 | 27 | 6 | 1.47 | | | | 27 | 9 | .82 | 23 “ | 1 | .09 |
| 28 | 7 | 1.01 | | | | 28 | 10 | 2.46 | | | | 28 | 17 | 1.55 | | | |
| 29 | 8 | 1.15 | | | | 29 | 2 | .49 | | | | 29 | 10 | .99 | | | |
| 30 | 0 | ...... | | | | 30 | 3 | .74 | | | | 30 | 3 | .27 | | | |
| 31 | 1 | .15 | | | | 31 | 3 | .74 | | | | 31 | 4 | .36 | | | |
| 32 | 3 | .43 | | | | 32 | 6 | 1.47 | | | | 32 | 9 | .82 | | | |
| 33 | 2 | .29 | | | | 33 | 2 | .49 | | | | 33 | 4 | .36 | | | |
| 34 | 1 | .15 | | | | 34 | 4 | .99 | | | | 34 | 5 | .45 | | | |
| 35 | 1 | .15 | | | | 35 | 3 | .74 | | | | 35 | 4 | .36 | | | |
| 36 | 1 | .15 | | | | 36 | 3 | .74 | | | | 36 | 4 | .36 | | | |
| 37 | 3 | .43 | | | | 37 | 0 | ...... | | | | 37 | 3 | .27 | | | |
| | | | | 692 | 100.00 | | | | | 407 | 100.00 | | | | | 1099 | 100.00 |

It is unquestionably an advantage when diphtheria occurs in a family to remove the well children as speedily as possible in order that they may escape infection. The number of persons who have been thus removed during the years 1904-1909, and the number afterwards attacked are shown in Table XXI.

In a number of instances persons go away from home and return in a short time and before the warning sign has been removed from the house, and, of course, are occasionally taken sick on their return. None of these cases are included in the table, but only such as remain away until the warning sign is removed. During 1909 the number of persons thus removed was 108, of whom 94 were under 21 years of age. Of these 4 were attacked while away, on the 1st, 7th, 25th, and 27th day of removal. Besides these 14 others were found to harbor diphtheria bacilli but were not sick, and most of these returned to their homes.

During the years 1904-1909, 585 well persons were removed from their homes because of diphtheria. Of this number only 16 were taken sick while away from home. In previous reports I have attempted without much success to determine the number which would have been sick if they had remained at home. It seems not unlikely that from two to four times as many would have had the disease so that the removal of the well persons probably represents this amount of disease prevention.

## TABLE XXI.

### DIPHTHERIA, 1904-1909.

BENEFIT TO WELL PERSONS OF REMOVAL FROM INFECTED FAMILIES.

| Day of sickness of primary case on which removal took place. | Number of persons removed. | Percentage of removal for each day. | Age of those removed. | Number of each age removed. | Day of absence on which sickness developed. | Number taken sick. |
|---|---|---|---|---|---|---|
| | | | Under 1 | 5 | | |
| 1 | 104 | 17.78 | 1 | 27 | 1 | 1 |
| 2 | 122 | 20.86 | 2 | 13 | 2 | |
| 3 | 101 | 17.27 | 3 | 22 | 3 | 2 |
| 4 | 62 | 10.60 | 4 | 21 | 4 | 1 |
| 5 | 52 | 8.89 | 5 | 17 | 5 | 2 |
| 6 | 44 | 7.52 | 6 | 28 | 6 | 3 |
| 7 | 16 | 2.74 | 7 | 33 | 7 | 1 |
| 8 | 20 | 3.42 | 8 | 41 | 8 | 1 |
| 9 | 5 | .86 | 9 | 27 | 9 | |
| 10 | 16 | 2.74 | 10 | 31 | 10 | |
| 11 | 9 | 1.54 | 11 | 37 | 11 | |
| 12 | 3 | .51 | 12 | 30 | 12 | |
| 13 | 3 | .51 | 13 | 38 | 13 | 1 |
| 14 | 4 | .68 | 14 | 27 | 14 | |
| 15 | 3 | .51 | 15 | 33 | 15 | 1 |
| 16 | 2 | .34 | 16 | 19 | 16 | 1 |
| 17 | 3 | .51 | 17 | 16 | 17 | |
| 18 | 4 | .68 | 18 | 21 | 18 | |
| 19 | 0 | .00 | 19 | 15 | 19 | |
| 20 | 1 | .17 | 20 | 8 | 20 | |
| 21 | 1 | .17 | Adults. | 76 | 21 | |
| 22 | 2 | .34 | | | 22 | |
| 24 | 2 | .34 | | | 23 | |
| 25 | 2 | .34 | | | 27 | 1 |
| 28 | 1 | .17 | | | 33 | 1 |
| 40 | 1 | .17 | | | 41 | 1 |
| 45 | 1 | .17 | | | 42 | 1 |
| 57 | 1 | .17 | | | | |
| | 585 | 100.00 | | 585 | | 18 |

Since the records have been kept, only 10 of the well persons removed from diphtheria houses have been attacked with the disease on their return home. The particulars in regard to 8 of these were noted in the report for 1903, page 83. Since then there have been only two cases reported, on page 48 of the report for 1904, and page 54 of the report for 1906. The 10 cases occurred as follows: on the second day of the return, 1 case; on the sixth, 2; on the eighth, 1; on the ninth, 2; on the twelfth, 3, and during the third month, 1.

The question of the danger of diphtheria extending to other families in the same house is of great importance, and has been considered in previous reports. The following shows the instances in which such infection has taken place. The table includes all cases reckoned as diphtheria, whether or not the diagnosis was confirmed by bacteriological findings:

| | 1889-95. | 1896-1900. | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. | 1909. | Totals. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of additional families with children in the same house...... | 426 | 906 | 215 | 224 | 248 | 379 | 269 | 236 | 268 | 496 | 390 | 4,057 |
| Number of these additional families attacked. | 42 | 57 | 17 | 10 | 23 | 24 | 24 | 13 | 10 | 43 | 28 | 291 |
| Number of children in these families who were attacked. | 53 | 106 | 23 | 14 | 31 | 35 | 39 | 15 | 16 | 56 | 30 | 418 |

From the above table can be readily seen how small is the chance of a second family being attacked in a house where there is diphtheria. Of 4,057 such families, only 291, or 7.2 per cent, became infected. Observation has shown that in nearly all of these cases there was known to be direct and often close intercourse between the first and second families infected. In a large proportion of cases the infection probably takes place before the diagnosis is made and before the warning sign is placed on the house. Of the 28 infections of second families which occurred in 1909 9 were after the removal of the warning sign. These 9 were referred to on page 40. In 13 instances the second family was attacked during the first week of the initial sickness, and in all probability the infection took place before the disease was recognized. In two instances, on the 10th and 15th day, the nature of the first sickness was not recognized. In one house, 61 Huntington Ave., where 2 families were attacked on the 18th day of the initial sickness, there were 3 successive cases, the last occurring on the 17th day. As the earlier cases were promptly removed to the hospital, and the house was not placarded there was probably visiting between the families, and events showed that there was persistent latent infection in the first family. Another instance was in a large Italian tenement swarming with children, and with other cases nearby. There was only one other case of infection after the first week, and this was on the 25th day.

The accompanying table, Table XXII, shows the date of infection of second families in the house from 1904 to 1909 inclusive. Of 2,038 "other families" in the house, only 48 or 2.4 per cent were attacked after the first week of the initial sickness, and before the warning sign was removed. As was shown above, many of these infections are due to the fact that the first case is not recognized, and hence the different families in the house continue to visit one another, or in some instances to the fact that persons in the second family carry the bacilli for a time without being sick. Probably a large part of the infections during the first week take place before the disease is recognized so that it seems very probable that less than two and perhaps less than one per cent of families living in a house with a case of diphtheria contract the disease while the warning sign is on the house. And in this small percentage it is almost always known that the families are in direct communication.

It must be remembered that in houses with more than one family all usually use the same doors, halls, stairways, cellars, and often the same water closets, and it can be inferred that the danger of infection by means of such things, which is usually assumed to be very considerable, as a matter of fact, practically amounts to nothing. There is also shown to be no danger of the disease being air-borne from one family to another. The facts show that if there is no direct intercourse with the infected family there is no danger to another family living in the same house.

An extension from one family to another in the same house rarely, if ever, takes place except among those people who are evidently careless or have little control over their children. In most instances I have for a number of years allowed the children from the non-infected families to attend school. This, however, is not permitted until a culture is taken from throat and nose.

## TABLE XXII.

### DIPHTHERIA, 1909–1910.

DATE OF INFECTION OF OTHER FAMILIES IN HOUSE.

| DURING PERIOD OF ISOLATION OF FIRST SICKNESS. | | | | AFTER REMOVAL OF WARNING SIGN. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DAY OF INITIAL SICKNESS. | | | | DAY OF RELEASE FROM ISOLATION | | | |
| DAY OF INITIAL SICKNESS. | Number of cases | Day of Initial Sickness. | Number of cases. | Day. | Cases. | Day | Cases. | Day of release from Isolation. | Number of cases. | Day of release from Isolation. | Number of cases. |
| 1 | 9 | 38 | 2 | 1 | ...... | 38 | 1 | 1 | 1 | 38 | ...... |
| 2 | 17 | 39 | .... | 2 | ...... | 39 | 1 | 2 | ...... | 39 | ...... |
| 3 | 11 | 40 | .... | 3 | ...... | 40 | ...... | 3 | 3 | 40 | ...... |
| 4 | 8 | 41 | .... | 4 | ...... | 41 | ...... | 4 | ...... | 41 | ...... |
| 5 | 10 | 42 | .... | 5 | ...... | 42 | ...... | 5 | ...... | 42 | ...... |
| 6 | 13 | 43 | .... | 6 | ...... | 43 | ...... | 6 | ...... | 43 | ...... |
| 7 | 4 | 44 | .... | 7 | ...... | 44 | ...... | 7 | ...... | 44 | ...... |
| 8 | 3 | 45 | .... | 8 | ...... | 45 | ...... | 8 | 1 | 45 | ...... |
| 9 | 4 | 46 | .... | 9 | ...... | 46 | ...... | 9 | 1 | 46 | 1 |
| 10 | 3 | 47 | .... | 10 | ...... | 47 | ...... | 10 | 1 | 47 | ...... |
| 11 | 4 | 48 | .... | 11 | ...... | 48 | ...... | 11 | ...... | 48 | 1 |
| 12 | 2 | 49 | .... | 12 | 1 | 49 | ...... | 12 | ...... | 49 | ...... |
| 13 | 2 | 50 | .... | 13 | 1 | 50 | ...... | 13 | ...... | 50 | ...... |
| 14 | 1 | 51 | .... | 14 | ...... | 51 | ...... | 14 | ...... | 51 | ...... |
| 15 | 2 | 52 | .... | 15 | ...... | 52 | ...... | 15 | ...... | 52 | ...... |
| 16 | 1 | 53 | .... | 16 | ...... | 53 | ...... | 16 | ...... | 53 | ...... |
| 17 | 0 | 54 | .... | 17 | ...... | 54 | ...... | 17 | ...... | 54 | ...... |
| 18 | 4 | 55 | 1 | 18 | ...... | 55 | ...... | 18 | ...... | 55 | ...... |
| 19 | 1 | 56 | .... | 19 | ...... | 56 | ...... | 19 | ...... | 56 | ...... |
| 20 | 2 | 57 | .... | 20 | 1 | 57 | ...... | 20 | ...... | 57 | ...... |
| 21 | 2 | 58 | .... | 21 | ...... | 58 | ...... | 21 | ...... | 58 | ...... |
| 22 | 1 | 59 | .... | 22 | ...... | 59 | 1 | 22 | ...... | 59 | ...... |
| 23 | 0 | 60 | .... | 23 | ...... | 60 | 1 | 23 | 1 | 60 | ...... |
| 24 | 0 | 3d mo | .... | 24 | ...... | 3d mo | 6 | 24 | ...... | 3d mo | 5 |
| 25 | 2 | 4 " | 1 | 25 | ...... | 4 " | 3 | 25 | 1 | 4 " | 2 |
| 26 | 0 | 5 " | .... | 26 | ...... | 5 " | 2 | 26 | 1 | 5 " | 5 |
| 27 | 0 | 6 " | .... | 27 | ...... | 6 " | 7 | 27 | ...... | 6 " | 4 |
| 28 | 0 | 7 " | .... | 28 | ...... | 7 " | 0 | 28 | ...... | 7 " | 0 |
| 29 | 1 | 8 " | .... | 29 | ...... | 8 " | 1 | 29 | ...... | 8 " | 1 |
| 30 | 0 | 9 " | .... | 30 | ...... | 9 " | 4 | 30 | ...... | 9 " | 4 |
| 31 | 0 | 10 " | .... | 31 | ...... | 10 " | 0 | 31 | ...... | 10 " | 2 |
| 32 | 1 | 11 " | .... | 32 | 1 | 11 " | 2 | 32 | ...... | 11 " | 0 |
| 33 | 1 | 12 " | .... | 33 | 1 | 12 " | 1 | 33 | 1 | 12 " | 1 |
| 34 | 1 | | | 34 | ...... | | | 34 | ...... | | |
| 35 | 0 | | | 35 | 2 | | | 35 | ...... | | |
| 36 | 1 | | | 36 | ...... | | | 36 | .... | | |
| 37 | 1 | | | 37 | ...... | | | 37 | ...... | | |
| | | | 116 | | | | 37 | | | | 37 |

Diphtheria is generally believed to render a person more liable to scarlet fever and the two diseases are supposed frequently to occur together. Besides the cases of cross infection which took place at the hospital in 1909, there were four cases of mixed infection at home, in which the two diseases appeared to develop at the same time. Diphtheria bacilli were found in all four cases. There was another instance, in which a person sick with scarlet fever November 29 was believed to have developed laryngeal diphtheria on January 3d, but four successive cultures from throat and nose failed to show the presence of diphtheria bacilli.

At 125 Cedar Street a child 10 months old had measles on June 12th, and on June 18 the eyes became inflamed, with more or less exudation, and diphtheria bacilli were found to be present.

### SCARLET FEVER.

The table on the next page shows the cases and deaths from scarlet fever for each month during the last twenty-five years, and the number and ratio of deaths and cases for the last twenty-six years:

## TABLE XXIII. SCARLET FEVER.

| Year. | Jan. | | Feb. | | Mar. | | April. | | May. | | June. | | July. | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total Cases. | Total Deaths. | Case Fatality. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | | | |
| 1884 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 538 | **57** | 10.59 |
| 1885 | 69 | **5** | 43 | **8** | 42 | **8** | 23 | **4** | 24 | .. | 19 | **1** | 10 | **2** | 13 | **1** | 30 | **2** | 45 | **3** | 25 | **1** | 40 | **3** | 383 | **38** | 9.92 |
| 1886 | 56 | **4** | 39 | **3** | 16 | .. | 19 | **1** | 15 | **1** | 4 | **2** | 14 | **2** | 12 | **4** | 11 | **1** | 15 | **3** | 16 | **4** | 20 | **5** | 237 | **30** | 12.65 |
| 1887 | 54 | **8** | 38 | **3** | 39 | **4** | 48 | **1** | 22 | **2** | 21 | **5** | 26 | **8** | 42 | **10** | 75 | **17** | 256 | **47** | 122 | **22** | 105 | **26** | 848 | **153** | 18.04 |
| 1888 | 91 | **18** | 49 | **19** | 44 | **9** | 45 | **13** | 31 | **8** | 18 | **4** | 15 | **1** | 9 | **1** | 13 | **1** | 12 | **2** | 21 | **3** | 13 | .. | 361 | **79** | 21.88 |
| 1889 | 16 | **4** | 13 | .. | 34 | **3** | 19 | **8** | 11 | **3** | 14 | **2** | 3 | **4** | 6 | .. | 13 | .. | 9 | **1** | 14 | .. | 10 | .. | 162 | **25** | 15.43 |
| 1890 | 1 | .. | 6 | **1** | 20 | **1** | 16 | **1** | 13 | **2** | 9 | .. | 3 | .. | 1 | .. | 5 | .. | 4 | .. | 24 | **2** | 34 | **1** | 136 | **8** | 5.88 |
| 1891 | 53 | **1** | 53 | .. | 47 | **5** | 48 | **2** | 40 | .. | 13 | **1** | 17 | **1** | 9 | .. | 11 | **1** | 34 | **2** | 40 | .. | 37 | **4** | 402 | **17** | 4.19 |
| 1892 | 45 | **4** | 48 | **5** | 65 | **6** | 50 | **1** | 36 | **4** | 42 | **3** | 15 | **1** | 10 | **2** | 17 | .. | 24 | .. | 43 | **4** | 77 | **7** | 472 | **37** | 7.84 |
| 1893 | 70 | **8** | 64 | **6** | 63 | **6** | 95 | **9** | 122 | **12** | 89 | **14** | 69 | **12** | 66 | **6** | 46 | **14** | 58 | **2** | 51 | **1** | 72 | **7** | 865 | **97** | 11.21 |
| 1894 | 99 | **8** | 48 | **7** | 37 | **4** | 54 | **8** | 59 | **8** | 28 | .. | 33 | **2** | 44 | **2** | 48 | **7** | 103 | **5** | 89 | **3** | 112 | **3** | 754 | **56** | 7.42 |
| 1895 | 144 | **8** | 120 | **6** | 129 | **12** | 129 | **16** | 52 | **6** | 48 | **4** | 54 | **2** | 60 | **4** | 56 | .. | 54 | **2** | 78 | **2** | 65 | **1** | 989 | **64** | 6.47 |
| 1896 | 97 | **3** | 75 | **8** | 53 | **6** | 40 | **1** | 39 | **1** | 27 | **1** | 21 | .. | 23 | **1** | 33 | **2** | 46 | **1** | 76 | **2** | 58 | **7** | 588 | **33** | 5.66 |
| 1897 | 46 | .. | 23 | .. | 21 | **2** | 29 | **3** | 30 | .. | 25 | **1** | 12 | .. | 15 | .. | 22 | **1** | 30 | **3** | 37 | .. | 38 | **1** | 328 | **11** | 3.35 |
| 1898 | 71 | **1** | 41 | **1** | 21 | .. | 22 | .. | 26 | .. | 12 | .. | 17 | .. | 6 | .. | 19 | .. | 29 | **1** | 35 | **1** | 23 | .. | 322 | **4** | 1.24 |
| 1899 | 46 | **5** | 26 | **2** | 29 | **1** | 45 | **1** | 29 | **4** | 16 | **1** | 16 | .. | 24 | **1** | 62 | .. | 56 | **2** | 78 | **1** | 61 | **1** | 488 | **19** | 3.89 |
| 1900 | 79 | **2** | 40 | **2** | 56 | **2** | 44 | **1** | 37 | **2** | 25 | .. | 14 | **1** | 5 | .. | 13 | .. | 25 | **1** | 39 | .. | 49 | .. | 426 | **11** | 2.58 |
| 1901 | 19 | .. | 24 | .. | 37 | .. | 35 | **1** | 42 | **2** | 21 | **1** | 11 | **1** | 19 | **2** | 16 | .. | 38 | .. | 39 | **2** | 27 | .. | 328 | **9** | 2.74 |
| 1902 | 26 | .. | 13 | .. | 52 | **1** | 35 | **2** | 30 | **1** | 20 | **2** | 13 | **1** | 11 | **2** | 18 | .. | 12 | .. | 10 | .. | 14 | .. | 254 | **9** | 3.54 |
| 1903 | 31 | .. | 25 | **2** | 38 | **1** | 43 | **1** | 48 | **6** | 56 | **5** | 50 | **1** | 33 | **3** | 40 | **2** | 44 | **2** | 71 | **2** | 102 | .. | 581 | **25** | 4.30 |
| 1904 | 183 | **7** | 159 | **6** | 210 | **5** | 225 | **8** | 125 | **10** | 94 | **4** | 40 | .. | 23 | .. | 32 | .. | 30 | .. | 38 | .. | 61 | **3** | 1220 | **43** | 3.52 |
| 1905 | 47 | **4** | 63 | .. | 61 | **4** | 63 | **4** | 36 | **2** | 28 | **1** | 14 | **1** | 15 | **1** | 27 | .. | 30 | .. | 37 | **1** | 33 | .. | 454 | **18** | 3.96 |
| 1906 | 43 | **2** | 34 | **4** | 42 | **3** | 39 | **4** | 24 | **2** | 19 | **1** | 13 | **0** | 29 | **3** | 32 | **4** | 72 | **5** | 114 | **23** | 154 | **23** | 615 | **74** | 12.03 |
| 1907 | 136 | **19** | 125 | **24** | 113 | **21** | 83 | **15** | 44 | **4** | 44 | **1** | 22 | **3** | 45 | **4** | 38 | **2** | 43 | **5** | 42 | **2** | 74 | **4** | 809 | **104** | 12.85 |
| 1908 | 45 | **9** | 39 | **4** | 51 | **3** | 65 | **3** | 53 | **2** | 49 | .. | 17 | .. | 5 | .. | 17 | .. | 21 | .. | 46 | **1** | 33 | .. | 441 | **22** | 5.21 |
| 1909 | 61 | **1** | 53 | **1** | 53 | .. | 39 | **2** | 51 | **4** | 36 | .. | 40 | .. | 32 | .. | 38 | .. | 63 | .. | 82 | **2** | 79 | .. | 627 | **10** | 1.60 |
| Totals | 1628 | **121** | 1261 | **112** | 1373 | **107** | 1353 | **110** | 1039 | **86** | 777 | **54** | 559 | **43** | 557 | **47** | 732 | **54** | 1153 | **87** | 1267 | **79** | 1391 | **96** | 13628 | **1053** | 7.73 |

The value of the frequency of plural deaths, that is secondary deaths in a family, as an index of the virulence of an infectious disease was discussed in the report for 1908. For several years previous to 1906 the number of plural deaths and the case fatality had both been low. In 1906 the case fatality rose to 12.03, and the plural deaths to 10.8, and in 1907 the figures were 12.85 and 12.50 respectively. During the two years, 1908-9, the case fatality fell to 3.11, and there were no plural deaths in either year.

The following shows the case fatality by ages of scarlet fever during the twenty-three years, 1887-1909:

| | 1887-1908. | | | 1909. | | |
|---|---|---|---|---|---|---|
| AGES. | CASES. | DEATHS. | FATALITY. | CASES. | DEATHS. | FATALITY. |
| Under 1 year | 253 | 46 | 18.18 | 11 | 3 | 27.27 |
| 1 and under 2 | 507 | 131 | 25.84 | 21 | 0 | .00 |
| 2 " " 5 | 2933 | 359 | 12.24 | 145 | 4 | 2.76 |
| 5 " " 10 | 4661 | 262 | 5.62 | 259 | 2 | .77 |
| 10 " " 15 | 1722 | 60 | 3.43 | 107 | 0 | .00 |
| 15 " " 20 | 508 | 23 | 4.53 | 33 | 1 | 3.03 |
| Adults | 661 | 38 | 5.74 | 37 | 0 | .00 |
| | 11245 | 919 | 8.17 | 613 | 10 | 1.63 |

Table XXIV shows the number and percentage of persons of different ages exposed to scarlet fever who contracted it, and the number who did not. When I began to collect these facts in 1889, the inspector was not careful to obtain the age in every case, so that until 1890 only a portion of the cases are contained in the table, and it is only since 1893 that the facts in regard to all the adults in the family have been obtained. The number exposed means all the members of the family where the disease occurred who had not previously had the disease. Cases in public institutions are not included in this table.

Cases in public institutions or in places other than private families are included in Table XXIII but not in Table XXIV. On pages 92 and 93 of the report for 1903 may be found a review of institutional outbreaks previous to that year, and the outbreaks since 1903 are noted in the report for each year. During 1909 there were 14 cases in institutions by months as follows: January 2, February 1, August 3, October 1, November 2, December 5.

In the Rhode Island Hospital 10 cases developed during the year, which are described on a subsequent page.

The next table, Table XXV, shows the percentage attacked at each age, also the sex, and whether the cases were primary or secondary. It only covers the six years, 1904 to 1909, and includes only those families in which the primary case lived and remained at home. The figures on which the percentages are calculated include all the members of the family who had not had the disease, and who were therefore supposed to be susceptible. The primary cases are then deducted from these, and the remainders are the bases on which the attack rates for secondary cases are calculated.

## TABLE XXIV.

### SCARLET FEVER.

| Ages. | Cases. | | | | | | | Totals. | Number Exposed. Including Cases. | | | | | | | | Attack Rates. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1887-1895. | 1896-00. | 1901-1905. | 1906. | 1907. | 1908. | 1909. | | 1887-1895. | 1896-00. | 1901-1905. | 1906. | 1907. | 1908. | 1909. | Totals. | |
| Under 1 year.. | 146 | 39 | 30 | 13 | 24 | 1 | 11 | 264 | 542 | 218 | 283 | 87 | 126 | 40 | 77 | 1373 | 19.30 |
| 1 " | 199 | 99 | 115 | 36 | 43 | 15 | 21 | 528 | 455 | 189 | 293 | 90 | 105 | 51 | 58 | 1231 | 42.81 |
| 2 years. | 365 | 167 | 174 | 55 | 64 | 20 | 46 | 891 | 671 | 227 | 353 | 95 | 110 | 47 | 83 | 1596 | 56.45 |
| 3 " | 428 | 190 | 259 | 59 | 78 | 40 | 43 | 1097 | 744 | 228 | 422 | 94 | 130 | 61 | 79 | 1758 | 62.40 |
| 4 " | 425 | 221 | 225 | 52 | 67 | 44 | 56 | 1090 | 704 | 229 | 351 | 91 | 125 | 75 | 87 | 1662 | 65.58 |
| 5 " | 474 | 237 | 276 | 53 | 50 | 28 | 53 | 1171 | 818 | 258 | 428 | 95 | 97 | 58 | 92 | 1846 | 63.43 |
| 6 " | 461 | 214 | 247 | 49 | 64 | 44 | 62 | 1141 | 747 | 239 | 409 | 91 | 102 | 69 | 102 | 1759 | 64.87 |
| 7 " | 429 | 196 | 217 | 42 | 59 | 32 | 52 | 1027 | 750 | 215 | 377 | 89 | 106 | 59 | 81 | 1677 | 61.24 |
| 8 " | 306 | 151 | 244 | 45 | 42 | 30 | 50 | 868 | 604 | 181 | 376 | 69 | 76 | 55 | 85 | 1446 | 60.03 |
| 9 " | 268 | 117 | 177 | 38 | 45 | 26 | 42 | 713 | 546 | 174 | 346 | 73 | 94 | 54 | 79 | 1366 | 52.19 |
| 10 " | 208 | 94 | 146 | 29 | 42 | 26 | 32 | 577 | 435 | 147 | 293 | 55 | 87 | 55 | 68 | 1140 | 50.61 |
| 11 " | 156 | 70 | 90 | 17 | 40 | 22 | 23 | 418 | 356 | 132 | 225 | 58 | 79 | 51 | 57 | 958 | 43.63 |
| 12 " | 138 | 62 | 79 | 19 | 29 | 10 | 25 | 362 | 370 | 110 | 206 | 45 | 69 | 27 | 58 | 885 | 40.90 |
| 13 " | 102 | 38 | 50 | 11 | 20 | 8 | 16 | 245 | 282 | 118 | 162 | 36 | 68 | 31 | 43 | 740 | 33.10 |
| 14 " | 88 | 36 | 62 | 10 | 13 | 7 | 11 | 227 | 267 | 115 | 174 | 34 | 44 | 35 | 37 | 706 | 32.15 |
| 15 " | 59 | 20 | 54 | 2 | 7 | 1 | 6 | 149 | 209 | 77 | 145 | 23 | 55 | 25 | 39 | 573 | 26.00 |
| 16 " | 45 | 20 | 41 | 3 | 7 | 3 | 9 | 128 | 186 | 83 | 146 | 27 | 45 | 27 | 34 | 548 | 23.36 |
| 17 " | 36 | 19 | 36 | 6 | 7 | 6 | 11 | 121 | 137 | 79 | 117 | 29 | 41 | 35 | 30 | 468 | 25.85 |
| 18 " | 23 | 12 | 21 | 2 | 9 | 3 | 4 | 74 | 108 | 72 | 107 | 22 | 44 | 17 | 21 | 391 | 18.93 |
| 19 " | 23 | 12 | 18 | 5 | 6 | 2 | 3 | 69 | 102 | 74 | 79 | 19 | 40 | 21 | 23 | 358 | 19.55 |
| 20 " | 25 | 6 | 16 | 5 | 1 | 3 | 2 | 58 | 94 | 60 | 84 | 24 | 31 | 20 | 16 | 329 | 17.63 |
| Adults....... | 211 | 84 | 172 | 36 | 56 | 46 | 35 | 640 | 3058 | 3212 | 3811 | 887 | 1241 | 820 | 969 | 13998 | 4.59 |
| Totals....... | 4615 | 2104 | 2749 | 587 | 773 | 417 | 613 | 11858 | 12185 | 6437 | 9187 | 2133 | 2915 | 1733 | 2218 | 36808 | 32.22 |

## TABLE XXV.

### SCARLET FEVER 1904–1909.

Cases from families in which the patient lived and remained at home during the whole illness.

| AGES. | SUSCEPTIBLE PERSONS NOT SICK INCLUDING CASES. | | PRIMARY CASES. | | | | | | SECONDARY CASES. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | Attack Rates. | F. | Attack Rates. | Total M. and F. | Attack Rates. | M. | Attack Rates. | F. | Attack Rates. | Total M. and F. | Attack Rates. |
| Under 1 year. | 158 | 163 | 17 | 10.7 | 10 | 6.1 | 27 | 8.4 | 8 | 5.7 | 8 | 5.2 | 16 | 5.4 |
| 1 “ | 143 | 151 | 32 | 22.4 | 34 | 22.5 | 66 | 22.4 | 18 | 16.2 | 27 | 23.1 | 45 | 19.7 |
| 2 years | 201 | 169 | 65 | 32.3 | 66 | 39.0 | 131 | 35.4 | 38 | 27.9 | 25 | 24.3 | 63 | 26.4 |
| 3 “ | 199 | 202 | 78 | 39.2 | 91 | 45.0 | 169 | 42.1 | 43 | 35.5 | 26 | 23.4 | 69 | 29.7 |
| 4 “ | 220 | 201 | 91 | 41.4 | 78 | 38.8 | 169 | 40.1 | 48 | 37.2 | 42 | 34.1 | 90 | 35.7 |
| 5 “ | 217 | 204 | 85 | 39.2 | 88 | 43.1 | 173 | 41.1 | 43 | 32.6 | 34 | 29.3 | 77 | 31.0 |
| 6 “ | 217 | 235 | 106 | 48.9 | 109 | 46 4 | 215 | 47.6 | 32 | 28.8 | 37 | 29.4 | 69 | 29.1 |
| 7 “ | 187 | 211 | 83 | 44.4 | 97 | 46.0 | 180 | 45.2 | 25 | 24.0 | 37 | 32.5 | 62 | 28.4 |
| 8 “ | 177 | 211 | 75 | 42.4 | 103 | 48.8 | 178 | 45.9 | 28 | 27.4 | 35 | 32.3 | 63 | 30.0 |
| 9 “ | 157 | 202 | 62 | 39.5 | 91 | 45.0 | 153 | 42.6 | 16 | 16.8 | 25 | 22.5 | 41 | 19.9 |
| 10 “ | 162 | 166 | 50 | 30.9 | 61 | 36.7 | 111 | 33.8 | 20 | 17.9 | 24 | 22.9 | 44 | 20.3 |
| 11 “ | 148 | 140 | 34 | 22.9 | 54 | 38.6 | 88 | 30.6 | 12 | 10.5 | 19 | 22 1 | 31 | 15.5 |
| 12 “ | 127 | 126 | 29 | 22.8 | 43 | 34.1 | 72 | 28.5 | 17 | 17.3 | 17 | 20.5 | 34 | 18 8 |
| 13 “ | 82 | 115 | 12 | 14.6 | 30 | 26.1 | 42 | 21.3 | 9 | 12.9 | 6 | 7.1 | 15 | 9.7 |
| 14 “ | 97 | 101 | 25 | 25.8 | 25 | 24.7 | 50 | 25.3 | 2 | 2.8 | 11 | 14.5 | 13 | 8.8 |
| 15 “ | 82 | 95 | 12 | 14.6 | 18 | 18.8 | 30 | 16.9 | 4 | 5.7 | 9 | 11.7 | 13 | 8.8 |
| 16 “ | 89 | 75 | 14 | 15.7 | 11 | 14.7 | 25 | 15.3 | 3 | 4.0 | 6 | 9.4 | 9 | 6.5 |
| 17 “ | 79 | 62 | 9 | 11.4 | 11 | 17.7 | 20 | 14.1 | 6 | 8.6 | 2 | 3.9 | 8 | 6.6 |
| 18 “ | 65 | 65 | 5 | 7.7 | 9 | 13.8 | 14 | 10.8 | 2 | 3.3 | 5 | 8.9 | 7 | 6.0 |
| 19 “ | 58 | 62 | 6 | 10.4 | 5 | 8.1 | 11 | 9.2 | 2 | 3.9 | 2 | 3.5 | 4 | 3.7 |
| 20 “ | 48 | 49 | 3 | 6.3 | 6 | 12.2 | 9 | 9.3 | 0 | .0 | 2 | 4.7 | 2 | 2.3 |
| Adults...... | 2,125 | 2,344 | 62 | 2.9 | 68 | 2.9 | 130 | 2.9 | 13 | .6 | 39 | 1.7 | 52 | 1.2 |
| Totals...... | 5,038 | 5,349 | 955 | 19.0 | 1,108 | 20.7 | 2,063 | 19.9 | 389 | 9.5 | 438 | 10.3 | 827 | 9.9 |

As was to be expected, the difference between male and female infection is not so marked among the primary as among the secondary cases. Thus of the primary cases the percentage of those exposed is 2.9 for males of 21 years and over and 2.9 for females, while for secondary cases in the family the percentages are 0.6 and 1.7. After the disease is recognized the men in the family usually try to keep away from the sickness as much as possible, while the women are brought into the closest contact with the patients. Between the ages of 12 and 20 the ratio of cases to exposures is for primary cases 15.8 for males, and 21.1 for females; for subsequent cases 7.4 for males and 10.1 for females. Below the age of 12 years the attack rates for primary cases are for males, 35.5, females, 39.1; for secondary cases they are for males, 23.5, and for females, 24.7.

The attack rates under "secondary cases" are particularly interesting and useful as showing the chance of other members of the family contracting the disease after it has been recognized.

It is of interest to know when the secondary cases in the family develop the disease. This is shown for the last six years in Table XXVI. It appears that second cases are most likely to appear on the second day of the sickness, thus indicating a short period of incubation. 53.83 per cent developed during the first week, and 75.67 per cent during the first two weeks of the initial sickness. Subsequent cases of course occur somewhat later, and the day of greatest frequency for these is the sixth.

## TABLE XXVI. Scarlet Fever. 1904–1909.

### DAY OF INITIAL SICKNESS ON WHICH SECONDARY CASES OCCURRED.

| Second Cases. | | | | | | Third and Later Cases. | | | | | | All Cases Subsequent to Primary. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. | Day of Initial Sickness. | Number of Cases. | Per cent. |
| 1 | 73 | 9.16 | 38 | 2 | .25 | 1 | 6 | 1.19 | 38 | 2 | .40 | 1 | 79 | 6.07 | 38 | 4 | .31 |
| 2 | 83 | 10.41 | 39 | 2 | .25 | 2 | 17 | 3.37 | 39 | 2 | .40 | 2 | 100 | 7.69 | 39 | 4 | .31 |
| 3 | 79 | 9.91 | 40 | 1 | .13 | 3 | 18 | 3.57 | 40 | 2 | .40 | 3 | 97 | 7.46 | 40 | 3 | .23 |
| 4 | 51 | 6.40 | 41 | 1 | .13 | 4 | 15 | 2 98 | 41 | 3 | .59 | 4 | 66 | 5.08 | 41 | 4 | .31 |
| 5 | 57 | 7.15 | 42 | 1 | .13 | 5 | 25 | 4.96 | 42 | 1 | .20 | 5 | 82 | 6.30 | 42 | 2 | .15 |
| 6 | 48 | 6.02 | 43 | 0 | ...... | 6 | 38 | 7.54 | 43 | 1 | .20 | 6 | 86 | 6.61 | 43 | 1 | .07 |
| 7 | 38 | 4.77 | 44 | 1 | .13 | 7 | 20 | 3.97 | 44 | 3 | .59 | 7 | 58 | 4.46 | 44 | 4 | .31 |
| 8 | 46 | 5.77 | 45 | 2 | .25 | 8 | 13 | 2.57 | 45 | 1 | .20 | 8 | 59 | 4.53 | 45 | 3 | .23 |
| 9 | 32 | 4.02 | 46 | 3 | .38 | 9 | 15 | 2.98 | 46 | 5 | .99 | 9 | 47 | 3.61 | 46 | 8 | .61 |
| 10 | 32 | 4.02 | 47 | 5 | .62 | 10 | 27 | 5.36 | 47 | 2 | .40 | 10 | 59 | 4.53 | 47 | 7 | .54 |
| 11 | 23 | 2.89 | 48 | 5 | .62 | 11 | 22 | 4 37 | 48 | 3 | .59 | 11 | 45 | 3.46 | 48 | 8 | .61 |
| 12 | 19 | 2.38 | 49 | 0 | ...... | 12 | 23 | 4.56 | 49 | 1 | .20 | 12 | 42 | 3.23 | 49 | 1 | .08 |
| 13 | 8 | 1.00 | 50 | 2 | .25 | 13 | 19 | 3.77 | 50 | 0 | ...... | 13 | 27 | 2.08 | 50 | 2 | .15 |
| 14 | 14 | 1.76 | 51 | 0 | ...... | 14 | 23 | 4.56 | 51 | 2 | .40 | 14 | 37 | 2.84 | 51 | 2 | .15 |
| 15 | 22 | 2.76 | 52 | 1 | .13 | 15 | 14 | 2.78 | 52 | 0 | ...... | 15 | 36 | 2.77 | 52 | 1 | .08 |
| 16 | 14 | 1.76 | 53 | 0 | ...... | 16 | 11 | 2.18 | 53 | 0 | ...... | 16 | 25 | 1.92 | 53 | 0 | ...... |
| 17 | 9 | 1.13 | 54 | 0 | ...... | 17 | 15 | 2.98 | 54 | 1 | .20 | 17 | 24 | 1.84 | 54 | 1 | .08 |
| 18 | 8 | 1.00 | 55 | 1 | .13 | 18 | 15 | 2.98 | 55 | 0 | ...... | 18 | 23 | 1.77 | 55 | 1 | .08 |
| 19 | 12 | 1.51 | 56 | 2 | .25 | 19 | 18 | 3.57 | 56 | 1 | .20 | 19 | 30 | 2.31 | 56 | 3 | .23 |
| 20 | 12 | 1.51 | 9th wk. | 7 | .87 | 20 | 6 | 1.19 | 9th wk. | 4 | .79 | 20 | 18 | 1.38 | 9th wk. | 11 | .85 |
| 21 | 11 | 1.38 | 10th " | 6 | .75 | 21 | 13 | 2.57 | 10th " | 1 | .20 | 21 | 24 | 1.84 | 10th " | 7 | .54 |
| 22 | 7 | .87 | 11th " | 5 | .62 | 22 | 8 | 1.59 | 11th " | 5 | .99 | 22 | 15 | 1.15 | 11th " | 10 | .77 |
| 23 | 6 | .75 | 12th " | 4 | .50 | 23 | 7 | 1.39 | 12th " | 2 | .40 | 23 | 13 | 1.00 | 12th " | 6 | .46 |
| 24 | 1 | .13 | 13th " | 2 | .25 | 24 | 8 | 1.59 | 13th " | 6 | 1.19 | 24 | 9 | .69 | 13th " | 8 | .61 |
| 25 | 7 | .87 | 14th " | 0 | ..... | 25 | 5 | .99 | 14th " | 1 | .20 | 25 | 12 | .92 | 14th " | 1 | .08 |
| 26 | 3 | .38 | 15th " | 1 | .13 | 26 | 8 | 1.59 | 15th " | 0 | ...... | 26 | 11 | .85 | 15th " | 1 | .08 |
| 27 | 5 | .62 | 16th " | 0 | ...... | 27 | 6 | 1.19 | 16th " | 1 | .20 | 27 | 11 | .85 | 16th " | 1 | .08 |
| 28 | 2 | .25 | 17th " | 1 | .13 | 28 | 1 | .20 | 17th " | 0 | ...... | 28 | 3 | .23 | 17th " | 1 | .08 |
| 29 | 4 | .50 | | | | 29 | 9 | 1.78 | 18th " | 0 | ...... | 29 | 13 | 1.00 | 18th " | 0 | ...... |
| 30 | 4 | .50 | | | | 30 | 4 | .79 | 19th " | 1 | .20 | 30 | 8 | .61 | 19th " | 1 | .08 |
| 31 | 3 | .38 | | | | 31 | 4 | .79 | 24th " | 1 | .20 | 31 | 7 | .54 | 24fh " | 1 | .08 |
| 32 | 2 | .25 | | | | 32 | 6 | 1.19 | | | | 32 | 8 | .61 | | | |
| 33 | 1 | .13 | | | | 33 | 2 | .40 | | | | 33 | 3 | .23 | | | |
| 34 | 1 | .13 | | | | 34 | 4 | .79 | | | | 34 | 5 | .38 | | | |
| 35 | 2 | .25 | | | | 35 | 1 | .20 | | | | 35 | 3 | .23 | | | |
| 36 | 1 | .13 | | | | 36 | 4 | .79 | | | | 36 | 5 | .38 | | | |
| 37 | 2 | .25 | | | | 37 | 2 | .40 | | | | 37 | 4 | .31 | | | |
| | | | | 797 | 100.00 | | | | | 504 | 100.00 | | | | | 1301 | 100.00 |

The following table gives the results of my observations during the past twenty-three years concerning certain points in the etiology and prevention of scarlet fever. This table for the years previous to 1892 does not include all the families and cases:

| | 1887-95. | 1896-1900. | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. | 1909. | Totals. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of additional families with susceptible children in the same house...... | 1,090 | 822 | 122 | 104 | 280 | 559 | 176 | 389 | 491 | 273 | 317 | 4,623 |
| Number of these additional families attacked.... | 139 | 41 | 4 | 3 | 11 | 27 | 14 | 26 | 26 | 4 | 18 | 313 |
| Number of children in these families who were attacked... | 238 | 85 | 5 | 3 | 15 | 46 | 27 | 36 | 44 | 4 | 23 | 526 |
| Number of children who where exposed and who had previously had scarlet fever | 278 | 365 | 68 | 42 | 91 | 192 | 98 | 78 | 227 | 43 | 73 | 1,555 |
| Number of these who were attacked a second time............ | 40 | 49 | 4 | 6 | 10 | 36 | 5 | 11 | 14 | 6 | 12 | 193 |
| Number of adults who were exposed and who had previously had scarlet fever | 541 | 625 | 112 | 74 | 153 | 394 | 179 | 147 | 264 | 117 | 155 | 2,761 |
| Number of these who were attacked a second time............ | 10 | 5 | 1 | 1 | 3 | 10 | 3 | 3 | 1 | 5 | 3 | 45 |

There were 18 instances in 1909 in which scarlet fever extended from one family to another in the same house. As there were 317 additional families containing susceptible children living in the same house with the family first infected, this was 5.7 per cent; 42 more than in the preceding year. Of the 18 secondary infections, 10 were after the removal of the warning sign from the initial case and have been considered on page 42. The 8 cases which developed while the warning sign was upon the house were on the 1st, 1st, 3d, 4th, 12th, 16th, 22d, and 48th day of the initial sickness.

The next table, Table XXVII, shows the number of second families attacked during the last six years, and the period of the initial sickness in which the second family was attacked, and if it was after release from isolation the day of release on which the secondary sickness developed. In 59 or 67.04 per cent of the cases infection occurred during the first two weeks, of which 41 were during the first week. Most of these cases during the first two weeks probably derived their infection from the first family before the disease was recognized. Only 29 second families developed their infection after the end of the second week, and while the warning sign was on the house. This is the time when the patients are desquamating, and when the disease is popularly believed to be most infectious, owing to the transmission of the desquamating skin by air currents or other means. These 29 cases are 1.3 per cent of the 2205 other families in the infected houses. As in a number of these cases there was known to be considerable communication between the families, it seems to be certain that in an ordinary tenement house scarlet fever is not easily carried from one family to another, and that effective isolation is comparatively easy. In fact everything goes to show that two or more families may live in the same house, using hallways, doors, and even water closets in common without scarlet fever extending from one to the other. All that is necessary is that there shall be absolutely no visiting between the families, and that the children shall never meet in play. There is no more evidence that scarlet fever is ever borne by the air from one family to another than that diphtheria is. It is probable of course that some of the second families living in the house with scarlet fever and which are invaded, get their infection from outside sources. It also appears that some contract it because the warning sign is removed, as sometimes happens, before the first family is free from infection. It also doubtless sometimes happens that families after maintaining isolation for several weeks, become careless and so permit the extension of the disease during its later stages.

## TABLE XXVII.

### SCARLET FEVER, 1904–1909.

### TIME OF INFECTION OF OTHER FAMILIES IN HOUSE.

| DURING PERIOD OF ISOLATION OF FIRST SICKNESS. | | | | AFTER TERMINATION OF ISOLATION. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DAY OF INITIAL SICKNESS. | | | | DAY OF RELEASE FROM ISOLATION. | | | |
| Day of Initial Sickness. | Number of Cases. | Day of Initial Sickness. | Number of Cases. | Day. | Number of Cases. | Day. | Number of Cases. | Day. | Number of Cases. | Day. | Number of Cases. |
| 1 | 11 | 38 | 1 | 1 | .... | 38 | .... | 1 | 1 | 38 | .... |
| 2 | 6 | 39 | 0 | 2 | .... | 39 | 1 | 2 | 2 | 39 | .... |
| 3 | 7 | 40 | 0 | 3 | .... | 40 | .... | 3 | 0 | 40 | 1 |
| 4 | 4 | 41 | 1 | 4 | .... | 41 | .... | 4 | 1 | 41 | .... |
| 5 | 7 | 42 | 2 | 5 | .... | 42 | .... | 5 | .... | 42 | .... |
| 6 | 4 | 43 | 0 | 6 | 1 | 43 | 1 | 6 | ... | 43 | .... |
| 7 | 2 | 44 | 1 | 7 | .... | 44 | .... | 7 | .... | 44 | .... |
| 8 | 4 | 45 | 0 | 8 | .... | 45 | .... | 8 | 1 | 45 | .... |
| 9 | 2 | 46 | 0 | 9 | .... | 46 | .... | 9 | 2 | 46 | .... |
| 10 | 1 | 47 | 0 | 10 | 1 | 47 | 1 | 10 | 3 | 47 | .... |
| 11 | 1 | 48 | 2 | 11 | .... | 48 | .... | 11 | .... | 48 | .... |
| 12 | 4 | 49 | 0 | 12 | .... | 49 | 2 | 12 | .... | 49 | .... |
| 13 | 4 | 50 | 0 | 13 | .... | 50 | 2 | 13 | .... | 50 | 1 |
| 14 | 2 | 51 | 0 | 14 | .... | 51 | .... | 14 | 1 | 51 | .... |
| 15 | 0 | 52 | 1 | 15 | .... | 52 | .... | 15 | .... | 52 | 1 |
| 16 | 1 | 53 | 1 | 16 | .... | 53 | .... | 16 | .... | 53 | 1 |
| 17 | 1 | 54 | 1 | 17 | .... | 54 | 1 | 17 | 2 | 54 | .... |
| 18 | 0 | 55 | 0 | 18 | 1 | 55 | 2 | 18 | .... | 55 | .... |
| 19 | 0 | 56 | 0 | 19 | ... | 56 | .... | 19 | .... | 56 | .... |
| 20 | 1 | 57 | 0 | 20 | 2 | 57 | 1 | 20 | .... | 57 | .... |
| 21 | 0 | 58 | 0 | 21 | .... | 58 | .... | 21 | 1 | 58 | 1 |
| 22 | 2 | 59 | 0 | 22 | .... | 59 | 1 | 22 | 1 | 59 | .... |
| 23 | 0 | 60 | 1 | 23 | .... | 60 | 1 | 23 | .... | 60 | .... |
| 24 | 1 | 3rd mo. | 2 | 24 | ... | 3rd mo. | 12 | 24 | 1 | 3rd mo. | 8 |
| 25 | 1 | 4th " | 0 | 25 | .... | 4th " | 7 | 25 | .... | 4th " | 3 |
| 26 | 1 | 5th " | 0 | 26 | .... | 5th " | 0 | 26 | 1 | 5th " | 1 |
| 27 | 0 | 6th " | 0 | 27 | .... | 6th " | 2 | 27 | .... | 6th " | 2 |
| 28 | 2 | 7th " | 0 | 28 | .... | 7th " | 3 | 28 | 1 | 7th " | 3 |
| 29 | 1 | 8th " | 0 | 29 | .... | 8th " | 1 | 29 | 1 | 8th " | .... |
| 30 | 2 | 9th " | 0 | 30 | .... | 9th " | 0 | 30 | 1 | 9th " | .... |
| 31 | 0 | 10th " | 0 | 31 | 1 | 10th " | 0 | 31 | .... | 10th " | 1 |
| 32 | 0 | 11th " | 0 | 32 | .... | 11th " | 1 | 32 | 1 | 11th " | .... |
| 33 | 0 | 12th " | 0 | 33 | .... | 12th " | 0 | 33 | .... | 12th " | 1 |
| 34 | 0 | | | 34 | .... | 13th " | 1 | 34 | .... | | |
| 35 | 2 | | | 35 | 1 | | | 35 | .... | | |
| 36 | 1 | | | 36 | .... | | | 36 | 1 | | |
| 37 | 0 | | | 37 | .... | | | 37 | 1 | | |
| | | | 88 | | | | 47 | | | | 47 |

As in diphtheria so in scarlet fever it is of advantage to remove the well children in the family at the earliest possible moment. During 1909 there were removed from 59 families 86 persons, of whom 69 were under 21 years of age. None of these had previously had the disease. Of these 86 persons 7 contracted the disease while away. At 266 Point Street 3 children were taken sick on the 2d, 21st and 26th day after removal. At 51 Dartmouth Avenue 2 were taken sick on the 6th and 20th day after removal, and at 162 Progress Avenue a child was taken sick on the 5th day after removal. No one was taken sick on return home after the warning sign had been removed.

At 134 Mawney Street a 12-year old child went away on the 2d day of the sickness and returned on the 40th day while the warning sign was still on the house, and was taken sick 4 days later. At 266 Point Street a child went away on the 4th day, returned on the 5th, and was taken sick 9 days later.

Table XXVIII shows the number of persons who have thus removed from home during the past twenty-three years, their ages, and the day of the primary sickness on which the removal took place. The number of persons taken sick while away from home is also shown, together with the day on which the sickness developed, and the number taken sick on their return home, together with the day of return on which the sickness developed.

## TABLE XXVIII.

### SCARLET FEVER 1887–1909.

### BENEFIT TO WELL PERSONS OF REMOVAL FROM INFECTED FAMILIES.

| Day of sickness of primary case. | Number of removals each each day. | Age of those removed. | Number at each age removed. | Day of absence on which sickness developed. | Number taken sick. | Day of return on which sickness developed. | Number taken sick. |
|---|---|---|---|---|---|---|---|
| 1 | 439 | Under 1 year.. | 28 | 1 | 11 | 1 | 1 |
| 2 | 502 | 1 " | 58 | 2 | 14 | 2 | 1 |
| 3 | 399 | 2 years. | 95 | 3 | 10 | 3 | 6 |
| 4 | 201 | 3 " | 92 | 4 | 5 | 4 | 1 |
| 5 | 104 | 4 " | 95 | 5 | 8 | 5 | 0 |
| 6 | 47 | 5 " | 91 | 6 | 2 | 6 | 2 |
| 7 | 22 | 6 " | 114 | 7 | 8 | 7 | 3 |
| 8 | 27 | 7 " | 108 | 8 | 4 | 8 | 0 |
| 9 | 10 | 8 " | 105 | 9 | 4 | 9 | 1 |
| 10 | 9 | 9 " | 96 | 10 | 4 | 10 | 1 |
| 11 | 14 | 10 " | 92 | 11 | 1 | 11 | 2 |
| 12 | 5 | 11 " | 84 | 12 | 5 | 12 | 2 |
| 13 | 2 | 12 " | 91 | 13 | 1 | 13 | 2 |
| 14 | 2 | 13 " | 95 | 14 | 1 | 14 | 2 |
| 15 | 7 | 14 " | 104 | 15 | 1 | 15 | 0 |
| 16 | 4 | 15 " | 65 | 16 | 1 | 16 | 0 |
| 17 | 0 | 16 " | 62 | 17 | 0 | 17 | 1 |
| 18 | 9 | 17 " | 59 | 18 | 1 | 23 | 2 |
| 19 | 1 | 18 " | 40 | 19 | 0 | 24 | 1 |
| 20 | 3 | 19 " | 44 | 20 | 3 | 25 | 1 |
| 21 | 4 | 20 " | 24 | 21 | 2 | 26 | 1 |
| 22 | 3 | Adults......... | 174 | 22 | 1 | 28 | 1 |
| 23 | 1 | | | 23 | ........ | 33 | 1 |
| 28 | 1 | | | 26 | 1 | 36 | 1 |
| Totals. | 1,816 | | 1,816 | | 88 | | 33 |

## CEREBRO-SPINAL MENINGITIS.

This disease has been very irregular in its appearance in Providence, as indeed it has everywhere, and it has never prevailed as extensively here as it has in many other places. There have been during the past few years considerable outbreaks in several cities and towns in neighboring states, but we have not had an exceptional amount here since 1898 until 1905. There were fewer deaths in proportion to the population in 1909 than in any year since 1890. The following table shows the number of deaths each year since 1864 when the first case was reported:

| | | | | | |
|---|---|---|---|---|---|
| 1864 | 2 | 1880 | 4 | 1896 | 7 |
| 1865 | 2 | 1881 | 11 | 1897 | 7 |
| 1866 | 1 | 1882 | 14 | 1898 | 34 |
| 1867 | 0 | 1883 | 15 | 1899 | 14 |
| 1868 | 1 | 1884 | 6 | 1900 | 14 |
| 1869 | 0 | 1885 | 3 | 1901 | 14 |
| 1870 | 0 | 1886 | 2 | 1902 | 10 |
| 1871 | 12 | 1887 | 7 | 1903 | 11 |
| 1872 | 10 | 1888 | 5 | 1904 | 11 |
| 1873 | 39 | 1889 | 3 | 1905 | 36 |
| 1874 | 10 | 1890 | 3 | 1906 | 41 |
| 1875 | 6 | 1891 | 5 | 1907 | 50 |
| 1876 | 4 | 1892 | 9 | 1908 | 23 |
| 1877 | 7 | 1893 | 8 | 1909 | 7 |
| 1878 | 7 | 1894 | 7 | | |
| 1879 | 7 | 1895 | 7 | 46 years | 496 |

The number of decedents from cerebro-spinal meningitis, in each division of age, and according to sex and parentage, is given in the following table for the 46 years, 1864 to 1909:

### AGE DISTRIBUTION.

| AGES. | Under 1 year. | 1 year. | 2 to 4. | 5 to 9. | 10 to 14. | 15 to 19. | 20 to 29. | 30 to 39. | 40 to 49. | 50 to 59. | 60 to 69. | 70 to 79. | Males. | Females. | American. | Foreign. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1864 to 1908. | 81 | 50 | 89 | 76 | 39 | 49 | 43 | 34 | 16 | 9 | 2 | 1 | 291 | 198 | 200 | 289 | 489 |
| 1909 | 3 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 2 | 5 | 7 |
| Total | 84 | 51 | 90 | 76 | 40 | 49 | 44 | 34 | 16 | 9 | 2 | 1 | 293 | 203 | 202 | 294 | 496 |

The following shows the seasonal distribution of the deaths 1905-1909:

### SEASONAL DISTRIBUTION.

| YEAR. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1905 | .... | 2 | 2 | 8 | 7 | 5 | 4 | 2 | 2 | .... | 2 | 3 | 37 |
| 1906 | .... | 1 | 5 | 8 | 10 | 1 | 3 | 3 | 4 | 4 | 2 | .... | 41 |
| 1907 | 3 | 3 | 7 | 9 | 5 | 6 | 2 | 1 | 2 | 1 | 5 | 6 | 50 |
| 1908 | 6 | 1 | 3 | 4 | 1 | 2 | 2 | 1 | 1 | 2 | .... | .... | 23 |
| 1909 | 1 | 3 | .... | .... | .... | .... | 1 | 1 | .... | .... | 1 | .... | 7 |

### SMALLPOX.

There has been no case of this disease reported since 1906. The cases and deaths previous to 1907 were given in the report for 1906, page 65.

### CONTAGIOUS DISEASE HOSPITAL.

In 1891 the Rhode Island Hospital began to receive a few scarlet fever and diphtheria patients in the "Russell Ward." In 1896 the city built a ward on the hospital grounds for the care of such patients as should be sent there by this department. The city was to pay $15 per week for each patient.

The various steps taken by the city for the construction of its own hospital for contagious diseases have been noted in previous reports. The hospital was finally completed and opened for the reception of patients on March 2, 1910. The commissioners in whose charge it is, are preparing a report, with description and plans of the buildings.

During the year 1909 there were removed to the Rhode Island hospital under my direction 426 cases, and the total expense to the city for caring for them was $23,542.62.

Table XXIX shows the number of cases admitted since the hospital was opened, and also the number of deaths that occurred in the hospital, and the amount paid for the care of the patients. This table only includes patients from Providence. It does not include cases which were brought in from outside the city or cases which developed in the hospital. These are referred to on another page. Before 1903 there might have been a very few cases of mixed infection admitted, but they were very few, if any, and were doubtless tabulated as either scarlet fever or diphtheria. Occasionally cases are sent to the hospital as scarlet fever, diphtheria, or measles, but which do not prove to be such, and are after a few days discharged. These cases were not noted in reports previous to 1904. In this table a case means a person, while in other parts of this report a case refers to the disease, and we may have two cases, one of scarlet fever and one of diphtheria, in the same person.

## TABLE XXIX.

### COMMUNICABLE DISEASE HOSPITAL.

| YEAR. | SCARLET FEVER. | | DIPHTHERIA. | | SCARLET FEVER AND DIPHTHERIA. | | MEASLES. | | OTHER DISEASES. | | Total Cases. | Expense. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | | |
| 1891.... | 6 | .... | 4 | 1 | .......... | ........ | ...... | .... | ........ | .... | 10 | $486 43 |
| 1892.... | 13 | 2 | 4 | 1 | .......... | ........ | ...... | .... | ........ | .... | 17 | 1,553 36 |
| 1893.... | 20 | 1 | 5 | 1 | .......... | ........ | ...... | .... | ........ | .... | 25 | 1,267 77 |
| 1894.... | 27 | 2 | 4 | 2 | .......... | ........ | ...... | .... | ........ | .... | 31 | 2,297 07 |
| 1895.... | 37 | .... | 27 | 3 | .......... | ........ | ...... | .... | ........ | .... | 64 | 3,614 78 |
| 1896.... | 35 | 2 | 103 | 10 | .......... | ........ | ...... | .... | ........ | .... | 138 | 4,679 64 |
| 1897.... | 22 | 2 | 57 | 6 | .......... | ........ | ...... | .... | ........ | .... | 79 | 4,924 35 |
| 1898.... | 21 | 2 | 70 | 6 | .......... | ........ | ...... | .... | ........ | ... | 91 | 3,404 74 |
| 1899.... | 40 | 2 | 47 | 3 | .......... | ........ | 6 | ... | ........ | .... | 93 | 4,390 06 |
| 1900.... | 49 | 1 | 87 | 10 | .......... | ........ | 21 | .... | ........ | ... | 157 | 6,943 61 |
| 1901.... | 37 | 2 | 115 | 20 | .......... | ........ | 1 | .... | ........ | .... | 153 | 5,039 58 |
| 1902.... | 24 | 4 | 80 | 11 | .......... | ........ | 1 | .... | ........ | .... | 105 | 4,442 18 |
| 1903.... | 62 | 8 | 147 | 17 | 2 | ........ | 23 | .... | ........ | .... | 234 | 11,352 56 |
| 1904.... | 79 | 1 | 125 | 12 | 8 | 1 | 3 | .... | 7 | .... | 222 | 12,616 72 |
| 1905.... | 71 | 1 | 124 | 20 | 1 | ........ | 5 | 1 | 3 | .... | 204 | 14,663 86 |
| 1906.... | 86 | 23 | 95 | 14 | 2 | 1 | 27 | 1 | 3 | .... | 213 | 10,113 74 |
| 1907.... | 208 | 40 | 157 | 21 | 3 | ........ | 7 | .... | 5 | .... | 380 | 23,390 23 |
| 1908.... | 103 | 7 | 251 | 22 | 4 | ........ | 33 | 2 | 3 (2) | .... | 394 | 22,989 48 |
| 1909.... | 155 | 3 | 177 | 18 | 3 | ........ | 62 | 4 | 29 | 2 | 426 | 23,542 62 |
| 1910 (1).. | 34 | 3 | 36 | 5 | .......... | ........ | 29 | 2 | 9 | .... | 98 | 4,854 54 |
| Totals. | 1,129 | 106 | 1,715 | 203 | 23 | 2 | 218 | 10 | 59 | 2 | 3,134 | 166,567 32 |

(1) From January 1 to March 2.

(2) 2 of these cases were measles and diphtheria and 1 was whooping cough.

On March 2, 1910, the City Hospital was opened and all patients at the Rhode Island Hospital sent there by this department were transferred to the new hospital. The record of cases up to March 2 is included in this report, but hereafter the report of the City Hospital will be issued separate from the health department report.

The 29 "other diseases" in 1909 were as follows:

| | Cases. | Deaths. |
|---|---|---|
| Measles and whooping cough | 3 | 0 |
| Whooping cough | 2 | 1 |
| Chickenpox | 6 | 1 |
| Diphtheria and measles | 1 | 0 |
| Diphtheria and whooping cough | 1 | 0 |
| Measles and chicken pox | 1 | 0 |
| German measles | 2 | 0 |
| Non-contagious (admitted as diphtheria) | 9 | 1 |
| " " ( " " scarlet fever) | 4 | 0 |
| | 29 | 3 |

The 6 "other diseases" in the first two months of 1910 were as follows:

| | Cases. | Deaths. |
|---|---|---|
| Diphtheria and measles | 1 | 0 |
| Diphtheria and mumps | 1 | 0 |
| Measles and whooping cough | 1 | 0 |
| Scarlet fever and mumps | 1 | 0 |
| German measles | 3 | 0 |
| Non-contagious (admitted diphtheria) | 1 | 0 |
| " " ( " measles) | 1 | 0 |
| | 9 | 0 |

Of the 155 scarlet fever cases in 1909 shown in Table XXIX, 1 contracted diphtheria while in the hospital, 1 chickenpox, 1 mumps, and 4 contracted measles, and of the 34 cases in 1910, 2 contracted mumps, 1 measles and 1 whooping cough.

Of the 177 diphtheria cases in 1909 4 contracted scarlet fever.

Besides the cases shown in the preceding table, there were treated in the hospital the following. The figures do not refer to persons, as sometimes the same person would have two or more diseases:

## TABLE XXX.

| YEARS. | CONTRACTED IN HOSPITAL. | | | | | | NON-RESIDENTS OF CITY. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SCARLET FEVER. | | DIPHTHERIA. | | MEASLES. | | SCARLET FEVER. | | DIPHTHERIA. | | MEASLES | |
| | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. |
| 1902...... | 4 | ...... | 16 | ...... | ...... | .... | .... | ...... | 5 | ........ | ...... | ..... |
| 1903...... | 5 | ...... | 26 | ...... | ...... | .... | 1 | ...... | 2 | ........ | ...... | ..... |
| 1904...... | 22 | ...... | 31(1) | ...... | ...... | .... | 1 | ...... | 8 | 1 | 3 | ..... |
| 1905...... | 13 | 1 | 27(2) | 1 | 2 | 1 | 2 | ...... | 3 | ........ | ...... | ..... |
| 1906...... | 22 | 1 | 10 | ...... | 7 | .... | 5 | 1 | 7(3) | ........ | 1 | ..... |
| 1907...... | 8 | 2 | 7(4) | ...... | 9(5) | 3 | 3 | ...... | 7 | 1 | ...... | ..... |
| 1908...... | 19 | 1 | 13 | 1 | 20 | 2 | 7 | 1 | 7 | 1 | 1 | ..... |
| 1909...... | 13 | 2 | 13 | 2 | 23 | 5 | 7 | ...... | 10 | ........ | 2 | ..... |
| 1910(6).... | 1 | ...... | ........ | ...... | 2 | .... | 9 | ...... | 2 | 1 | ...... | ..... |
| Totals.... | 107 | 7 | 143 | 4 | 63 | 11 | 35 | 2 | 51 | 4 | 7 | |

(1) There were also eight scarlet fever patients who showed diphtheria bacilli, but who had no noticeable symptoms of the disease.

(2) Six other persons in the hospital showed diphtheria bacilli but were not sick. One was probably infected on admission. Of the others one was a diphtheria nurse, and one a scarlet fever patient.

(3) One contracted scarlet fever also.

(4) There were also nine scarlet fever patients who had diphtheria bacilli present but showed no symptoms of the disease.

(5) All were scarlet fever patients.

(6) Also 2 cases of mumps, 1 of whooping cough and 1 of chickenpox developed in the hospital in 1910.

Of the 13 persons who contracted scarlet fever in the hospital in 1909, 4 were diphtheria patients, 2 were orderlies in the general wards, 2 were scarlet fever nurses, and 1 each were medical patient, child sick with measles and whooping cough, medical nurse, maid in nurses' home, and maid in scarlet fever ward. The single hospital case in 1910 was a patient with pneumonia.

Of the 13 cases of diphtheria which developed in the Rhode Island Hospital in 1909, 5 were medical patients, 3 were diphtheria nurses, 2 were nurses in the general wards, and 1 each were scarlet fever patient, surgical patient and nurse in the scarlet fever ward.

Of the 23 measles cases which developed in the hospital in 1909 21 were medical patients mostly in the children's ward, 1 was a nurse and 1 a laundress. Of the 2 cases in 1910 1 was a general nurse, and 1 a surgical patient.

It is of interest and value to know the time during which the patients remain in the hospital. This is important for the study of the duration of the infectious period, or the occurrence of "return cases." It is also of interest when considering the cost of maintenance of the hospital. The following table shows the stay in the hospital of the scarlet fever and diphtheria cases for the 7 years 1903-9. This table does not include the cases of mixed infection, the cases which originated in the hospital, or the cases which originated out of the city.

## TABLE XXXI.

### DURATION OF STAY IN HOSPITAL.

### SCARLET FEVER.

| Days. | 1903-1908 | | 1909 | | Total. | | Days. | 1903-1908 | | 1909 | Totals. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Living Cases. | Deaths. | Living Cases. | Deaths. | Living Cases. | Deaths. | | Living Cases. | Deaths. | Living Cases. | Living Cases. | Deaths. |
| Under 1 | 1 | 15 | .... | 1 | 1 | 16 | 51 | 7 | .... | 4 | 11 | .... |
| 1..... | 2 | 17 | .... | 1 | 2 | 18 | 52 | 7 | .... | 3 | 10 | .... |
| 2...... | 2 | 10 | .... | .. | 2 | 10 | 53 | 17 | .... | 5 | 22 | .... |
| 3...... | 2 | 9 | .... | .. | 2 | 9 | 54 | 11 | .... | 3 | 14 | .... |
| 4...... | 1 | 4 | .... | .. | 1 | 4 | 55 | 9 | ... | .... | 9 | .... |
| 5...... | 4 | 3 | .... | .. | 4 | 3 | 56 | 9 | .... | .... | 9 | .... |
| 6...... | 1 | 1 | .... | .. | 1 | 1 | 57 | 5 | .... | 2 | 7 | .... |
| 7..... | .... | 2 | .... | .. | .... | 2 | 58 | 8 | 1 | .... | 8 | 1 |
| 8...... | 1 | 5 | 1 | .. | 2 | 5 | 59 | 4 | 1 | .... | 4 | 1 |
| 9...... | 1 | 2 | .... | .. | 1 | 2 | 60 | 7 | .... | 1 | 8 | .... |
| 10...... | 1 | 1 | .... | .. | 1 | 1 | 61 | 4 | .... | 1 | 5 | .... |
| 11...... | 1 | 1 | 1 | .. | 2 | 1 | 62 | 2 | .... | 1 | 3 | .... |
| 12...... | .... | 1 | 1 | .. | 1 | 1 | 63 | 6 | .... | 1 | 7 | .... |
| 13...... | .... | .... | .... | .. | .... | .. | 64 | 5 | .... | 1 | 6 | .... |
| 14...... | .... | .... | .... | .. | .... | .. | 65 | 5 | .... | 2 | 7 | .... |
| 15...... | 1 | .... | 1 | .. | 2 | .. | 66 | 4 | .... | 1 | 5 | .... |
| 16...... | 1 | .... | .... | .. | 1 | .. | 67 | 3 | .... | 2 | 5 | ... |
| 17...... | 1 | .... | .... | .. | 1 | .. | 68 | 2 | .... | .... | 2 | .... |
| 18...... | 1 | 1 | 2 | .. | 3 | 1 | 69 | 2 | .... | 1 | 3 | .... |
| 19...... | 1 | .... | .... | 1 | 1 | 1 | 70 | 5 | .... | 1 | 6 | .... |
| 20...... | 1 | .... | .... | .. | 1 | .. | 71 | 4 | ... | .... | 4 | .... |
| 21...... | .... | .... | .... | .. | .... | .. | 72 | .... | .... | .... | .... | .... |
| 22...... | 1 | .... | .... | .. | 1 | .. | 73 | 1 | .... | .... | 1 | .... |
| 23...... | 2 | 1 | 1 | .. | 3 | 1 | 74 | .... | .... | 1 | 1 | .... |
| 24...... | .... | .... | .... | .. | .... | .. | 75 | 2 | .... | 1 | 3 | .... |
| 25...... | 5 | .... | 2 | .. | 7 | .. | 76 | 2 | .... | .... | 2 | .... |
| 26...... | 3 | 1 | .... | .. | 3 | 1 | 77 | 2 | .... | .... | 2 | .... |
| 27...... | 4 | .... | 1 | .. | 5 | .. | 78 | 3 | .... | 1 | 4 | .... |
| 28...... | 14 | .... | 1 | .. | 15 | .. | 79 | 1 | .... | .... | 1 | .... |
| 29...... | 7 | .... | 2 | .. | 9 | .. | 80 | 1 | .... | 1 | 2 | ... |
| 30...... | 7 | .... | 2 | .. | 9 | .. | 81 | .... | .... | 2 | 2 | .... |
| 31...... | 11 | .... | 4 | .. | 15 | .. | 82 | .... | .... | .... | .... | .... |
| 32...... | 12 | .... | 2 | .. | 14 | .. | 83 | 1 | .... | .... | 1 | .... |
| 33...... | 7 | .... | 5 | .. | 12 | .. | 84 | 1 | .... | .... | 1 | .... |
| 34...... | 7 | .. | 5 | .. | 12 | .. | 85 | .... | .... | 1 | 1 | .... |
| 35...... | 11 | .... | 6 | .. | 17 | .. | 86 | 1 | .... | .... | 1 | .... |
| 36...... | 16 | .... | 6 | .. | 22 | .. | 88 | 1 | .... | .... | 1 | .... |
| 37...... | 18 | .... | 4 | .. | 22 | .. | 89 | 2 | .... | ... | 2 | .... |
| 38...... | 14 | 2 | 7 | .. | 21 | 2 | 91 | 2 | .... | .... | 2 | ... |
| 39...... | 15 | 1 | 4 | .. | 19 | 1 | 94 | 1 | .... | .... | 1 | .... |
| 40...... | 14 | .... | 13 | .. | 27 | .. | 98 | 1 | .... | .... | 1 | .... |
| 41...... | 19 | .... | 3 | .. | 22 | .. | 101 | 1 | .... | .... | 1 | ... |
| 42...... | 18 | .... | 5 | .. | 23 | .. | 113 | 1 | .... | .... | 1 | .... |
| 43...... | 12 | .... | 6 | .. | 18 | .. | 144 | 1 | .... | .... | 1 | .... |
| 44...... | 13 | .... | 2 | .. | 15 | .. | 152 | 1 | ... | ... | 1 | .... |
| 45...... | 9 | .... | 3 | .. | 12 | .. | 180 | 1 | .... | .... | 1 | .... |
| 46...... | 15 | .... | 4 | .. | 19 | .. | | | .... | .... | | |
| 47...... | 8 | .... | 4 | .. | 12 | .. | | | ... | .. | | |
| 48...... | 25 | .... | 5 | .. | 30 | .. | | | .... | .... | | |
| 49..... | 11 | .... | 4 | .. | 15 | .. | | | .... | .. | | |
| 50...... | 13 | .... | 3 | .. | 16 | .. | | | .... | .... | | |
| Totals.. | .... | .... | .... | 3 | .... | .. | .... | 487 | 79 | 146 | 633 | 82 |

### DIPHTHERIA.

| Days. | 1903-1908 | | 1909 | | Total. | | Days. | 1903-1908 | | 1909 | Totals. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Living Cases. | Deaths. | Living Cases. | Deaths. | Living Cases. | Deaths. | | Living Cases. | Deaths. | Living Cases. | Living Cases. | Deaths. |
| Under 1 | 7 | 18 | .... | *1 | 7 | 21 | 51 | 3 | .... | 1 | 4 | .... |
| 1...... | 14 | 25 | .... | 7 | 14 | 32 | 52 | .... | .... | .... | .... | .... |
| 2...... | 7 | 8 | .... | 1 | 7 | 9 | 53 | 5 | .... | .... | 5 | .... |
| 3...... | 8 | 7 | 1 | .. | 9 | 7 | 54 | 1 | .... | .... | 1 | .... |
| 4...... | 9 | 6 | .... | .. | 9 | 6 | 55 | 2 | ... | .... | 2 | .... |
| 5...... | 13 | 4 | .... | .. | 13 | 4 | 56 | 4 | .... | .... | 4 | .... |
| 6...... | 22 | 7 | 3 | 1 | 25 | 8 | 57 | .... | .... | .... | .... | .... |
| 7...... | 20 | 6 | 11 | .. | 31 | 6 | 58 | 2 | .... | .... | 2 | .... |
| 8...... | 19 | 2 | 9 | .. | 28 | 2 | 59 | 1 | .... | .... | 1 | .... |
| 9...... | 26 | 4 | 19 | 2 | 45 | 6 | 60 | 2 | .... | .... | 2 | .... |
| 10...... | 32 | 4 | 15 | .. | 47 | 4 | 61 | 1 | ... | .... | 1 | .... |
| 11...... | 46 | 2 | 12 | .. | 58 | 2 | 62 | .... | .... | 1 | 1 | .... |
| 12...... | 51 | 2 | 13 | .. | 64 | 2 | 63 | 1 | .... | 1 | 2 | .... |
| 13... | 35 | .... | 6 | 1 | 41 | 1 | 64 | .... | ... | .... | .... | .... |
| 14...... | 35 | 2 | 8 | .. | 43 | 2 | 65 | 1 | ... | .... | 1 | .... |
| 15...... | 45 | 2 | 6 | .. | 51 | 2 | 66 | .... | .... | .... | .... | .... |
| 16...... | 45 | 2 | 6 | .. | 51 | 2 | 67 | 1 | .... | ... | 1 | .... |
| 17...... | 30 | 1 | 3 | .. | 33 | 1 | 68 | 1 | .... | .... | 1 | .... |
| 18...... | 26 | ... | 3 | .. | 29 | .. | 72 | 1 | .... | .... | 1 | .... |
| 19...... | 15 | .... | 5 | .. | 20 | .. | 73 | 1 | .... | .... | 1 | .... |
| 20...... | 32 | .... | 6 | .. | 38 | .. | 78 | 1 | .... | .... | 1 | .... |
| 21...... | 27 | .... | 3 | .. | 30 | .. | 84 | 1 | .... | .... | 1 | ... |
| 22...... | 30 | .... | 3 | .. | 33 | .. | 85 | 1 | ... | .... | 1 | .... |
| 23...... | 19 | .... | 2 | .. | 21 | .. | 86 | 1 | .... | .... | 1 | .... |
| 24...... | 16 | .... | 3 | .. | 19 | .. | 87 | .... | 1 | .... | .... | 1 |
| 25...... | 14 | .... | .... | .. | 14 | .. | 90 | 1 | .... | .... | 1 | .... |
| 26...... | 16 | .... | 2 | .. | 18 | .. | 99 | 1 | .... | ... | 1 | .... |
| 27...... | 17 | 2 | 1 | .. | 18 | 2 | | | | | | |
| 28...... | 10 | .... | 2 | .. | 12 | .. | | | | | | |
| 29...... | 7 | .... | .... | .. | 7 | .. | | | | | | |
| 30...... | 13 | .... | 3 | .. | 16 | .. | | | | | | |
| 31...... | 5 | .... | .... | .. | 5 | .. | | | | | | |
| 32...... | 5 | .... | .... | .. | 5 | .. | | | | | | |
| 33...... | 7 | .... | 1 | .. | 8 | .. | | | | | | |
| 34...... | 8 | .... | .... | .. | 8 | .. | | | | | | |
| 35...... | 6 | .... | .... | .. | 6 | . | | | | | | |
| 36...... | 10 | 1 | 2 | .. | 12 | 1 | | | | | | |
| 37...... | 9 | .... | .... | .. | 9 | .. | | | | | | |
| 38...... | 4 | .... | 1 | .. | 5 | .. | | | | | | |
| 39...... | 3 | .... | .... | .. | 3 | .. | | | | | | |
| 40...... | 3 | ... | 2 | 1 | 5 | 1 | | | | | | |
| 41...... | 7 | .... | ... | .. | 7 | .. | | | | | | |
| 42...... | 4 | .... | .... | .. | 4 | .. | | | | | | |
| 43...... | 2 | 1 | .... | .. | 2 | 1 | | | | | | |
| 44... | 3 | .... | .... | .. | 3 | .. | | | | | | |
| 45...... | 6 | .... | .... | 2 | 6 | 2 | | | | | | |
| 46...... | 4 | .... | .... | .. | 4 | .. | | | | | | |
| 47...... | 2 | .... | 1 | .. | 3 | .. | | | | | | |
| 48..... | 3 | .... | .... | .. | 3 | .. | | | | | | |
| 49...... | 1 | .... | .... | .. | 1 | .. | | | | | | |
| 50...... | 1 | 1 | .... | .. | 1 | 1 | | | | | | |
| Totals.. | .... | .... | .... | 16 | .... | .. | .... | 832 | 108 | 155 | 987 | 124 |

* Besides these three were two deaths from Pneumonia, which are not reckoned in the Diphtheria deaths.

The average stay in the hospital of all the cases was 17.61 days for diphtheria, and 40.77 days for scarlet fever.

The foregoing includes all cases whether the patients died or were discharged cured. Of the living cases, 1903-1909, the time in the hospital was for diphtheria 18.94 days, and for scarlet fever 45.22 days. The time for the cases that died was for diphtheria 7.16 days, and for scarlet fever 6.59 days. For 1909 the figures were scarlet fever living cases 43.6 days, deaths, 7 days; for diphtheria living cases, 15.4 days, deaths, 11.0 days.,

The following shows the number and percentage of cases discharged during each week following admission to the hospital. It includes the seven years, 1903-1909, but does not include the cases that died:

| WEEK. | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 and over. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scarlet Fever. | Cases. | 13 | 7 | 9 | 34 | 88 | 156 | 121 | 91 | 42 | 72 | 633 |
| | Per cent. | 2.05 | 1.11 | 1.42 | 5.37 | 13.90 | 24.64 | 19.12 | 14.38 | 6.64 | 11.37 | 100.00 |
| Diphtheria. | Cases. | 115 | 326 | 252 | 135 | 55 | 45 | 22 | 17 | 9 | 11 | 987 |
| | Per cent. | 11.65 | 33.03 | 25.53 | 13.68 | 5.57 | 4.56 | 2.23 | 1.72 | .91 | 1.12 | 100.00 |

From the above it is seen that the stay of the scarlet fever patients in the hospital is more than twice as long as the stay of the diphtheria patients. The latter remain in the hospital until two successive negative cultures are obtained from both throat and nose, yet over seventy per cent are discharged before the end of the third week. In scarlet fever the patients remain at least four weeks and until recently until desquamation has ceased. Of late a few cases have been discharged while desquamating slightly. About 76.59 per cent of the scarlet fever cases remain in the hospital over five weeks, while by that time 89.46 per cent of the diphtheria cases have been discharged. Nevertheless, isolation is more effective in diphtheria than in scarlet fever if the reinfection of the family after the return of the patient is any criterion, as I think it is. During the time that the hospital has been in operation 1086 cases of scarlet fever have been treated there. Return cases have developed 49 times or in 4.5 per cent. of the cases. The number of diphtheria cases treated at the hospital has been 1657. Return cases developed 33 times or in 1.9 per cent of the cases. So that although the scarlet fever cases remain in the hospital more than twice as long as the diphtheria cases they are more than twice as likely to carry infection to their homes. It is believed that these excellent results in diphtheria are due to the rule which has been followed almost from the first, of requiring two negative cultures from both throat and nose. This is not an absolute safeguard, as is shown by results here and elsewhere, for the discharged patients have at times been shown to be infected even after the negative cultures have been obtained. But this is a reliable criterion in the large majority of cases as is shown both by subsequent cultures and by clinical evidence. If cultures are not relied upon for deciding the time of discharge, an arbitrary limit must be fixed. Usually when this is done the public is given the benefit of the doubt rather than the patient, and the duration of the stay in the hospital is from 5 to 7 weeks.

The following table shows the amount of protection afforded the other members of the family when a person sick with scarlet fever or diphtheria is removed to the hospital.

In many instances some of the secondary cases only are taken to the hospital, and the primary case is left at home. Such cases have no bearing on the subject under consideration, and are not included in this tabulation.

## TABLE XXXII.

### BENEFIT TO THE FAMILY OF REMOVAL TO THE HOSPITAL.

1891–1909.

| Diphtheria. | | | | | | Scarlet Fever. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of sickness on which removal took place. | Number left at home. | Ages of those left at home. | | Day of removal on which sickness developed. | Number taken sick. | Day of sickness on which removal took place. | Number left at home. | Ages of those left at home. | | Day of removal on which sickness developed. | Number taken sick. |
| | | Age. | Number. | | | | | Age. | Number. | | |
| 1 | 316 | Under 1 | 169 | 1 | 21 | 1 | 223 | Under 1 | 139 | 1 | 3 |
| 2 | 945 | 1 | 134 | 2 | 15 | 2 | 543 | 1 | 82 | 2 | 7 |
| 3 | 1058 | 2 | 127 | 3 | 13 | 3 | 669 | 2 | 91 | 3 | 9 |
| 4 | 766 | 3 | 139 | 4 | 7 | 4 | 452 | 3 | 90 | 4 | 3 |
| 5 | 534 | 4 | 143 | 5 | 10 | 5 | 212 | 4 | 77 | 5 | 2 |
| 6 | 294 | 5 | 153 | 6 | 3 | 6 | 76 | 5 | 78 | 6 | 0 |
| 7 | 198 | 6 | 168 | 7 | 2 | 7 | 51 | 6 | 75 | 7 | 3 |
| 8 | 128 | 7 | 147 | 8 | 7 | 8 | 28 | 7 | 88 | 8 | 3 |
| 9 | 82 | 8 | 145 | 9 | 3 | 9 | 19 | 8 | 62 | 9 | 0 |
| 10 | 55 | 9 | 131 | 10 | 3 | 10 | 12 | 9 | 88 | 10 | 2 |
| 11 | 35 | 10 | 112 | 11 | 0 | 11 | 4 | 10 | 60 | 11 | 1 |
| 12 | 20 | 11 | 129 | 12 | 1 | 12 | 12 | 11 | 48 | 12 | 0 |
| 13 | 17 | 12 | 131 | 13 | 1 | 13 | 0 | 12 | 47 | 13 | 3 |
| 14 | 10 | 13 | 104 | 14 | 1 | 14 | 0 | 13 | 52 | 14 | 1 |
| 15 | 9 | 14 | 95 | 15 | 0 | 15 | 9 | 14 | 50 | 15 | 4 |
| 16 | 12 | 15 | 65 | 16 | 1 | 16 | 0 | 15 | 47 | 16 | 0 |
| 17 | 0 | 16 | 69 | 17 | 0 | 17 | 6 | 16 | 36 | 17 | 0 |
| 18 | 3 | 17 | 70 | 18 | 0 | 18 | 7 | 17 | 46 | 18 | 1 |
| 19 | 0 | 18 | 58 | 19 | 2 | 19 | 2 | 18 | 28 | 19 | 0 |
| 20 | 0 | 19 | 46 | 20 | 0 | 20 | 0 | 19 | 20 | 20 | 0 |
| 21 | 8 | 20 | 38 | 21 | 0 | 21 | 12 | 20 | 21 | 21 | 0 |
| 22 | 9 | Adults. | 2,132 | 22 | 1 | 22 | 11 | Adults. | 1,052 | 24 | 1 |
| 23 | 3 | ......... | .......... | 26 | 1 | 23 | 4 | ........ | .......... | 25 | 1 |
| 25 | 3 | ......... | .......... | ....... | ... | ....... | 4 | ......... | .......... | ........ | ... |
| ...... | ...... | ......... | .......... | ....... | ... | ....... | 10 | ......... | .......... | ........ | ... |
| ...... | ...... | ......... | .......... | ....... | ... | ....... | 11 | ......... | .......... | ........ | ... |
| | 4505 | | 4,505 | | 92 | | 2,377 | | 2,377 | | 44 |

One object in removing to the hospital persons sick with scarlet fever or diphtheria is to protect those who remain at home.

In 1909 scarlet fever patients were removed to the hospital from 108 families in which remained 611 susceptible persons, of whom 302 were under 21 years of age. Of those left behind 14 were taken sick as follows:

| Residence. | Day of Removal on which Sickness Developed. | Age. |
|---|---|---|
| 187 Allston street | 13 | 2 years. |
| 113 Arnold street | 3 | 5 " |
| 2 Bingham street | 15 | 8 " |
| 2 Bingham street | 15 | 3 " |
| 16 Caswell court | 11 | 3 " |
| 154 Dudley street | 3 | 5 " |
| 192 North Main street | 2 | 7 " |
| 88 Progress avenue | 2 | 4 " |
| 43 Ring street | 2 | 3 " |
| 20 Robinson street | 10 | 2 " |
| 45 Whipple street | 7 | 7 " |
| 277 Willard avenue | 3 | 1 year. |
| 325 Willard avenue | 4 | 5 years. |
| 325 Willard avenue | 4 | 6 " |

In diphtheria patients were removed to the hospital from 130 families in which there remained 720 persons of whom 386 were under 21 years of age. Of those left behind 21 became sick as follows:

| Residence. | Day of Removal on which Sickness Developed. | Age. |
|---|---|---|
| 31 Benefit street | 2 | 4 years. |
| 3 Boulstone lane | 2 | 3 " |
| R 18 Capwell street | 5 | 7 " |
| 49 Francis street | 1 | Adult. |
| 49 Francis street | 1 | " |
| 49 Francis street | 2 | 12 years. |
| 10 French street | 1 | 7 " |
| 153 Grove street | 1 | Adult. |

| Residence. | Day of Removal on which Sickness Developed. | Age. |
|---|---|---|
| 61 Huntington avenue | 5 | 8 years. |
| 61 Huntington avenue | 9 | Adult. |
| 61 Huntington avenue | 3 | 3 years. |
| 6 Moultrie court | 1 | 3 “ |
| 6 Moultrie court | 1 | 5 “ |
| 6 Moultrie court | 1 | 2 “ |
| 19 Newark street | 5 | 1 year. |
| 28 North Davis street | 1 | Adult. |
| 379 North Main street | 4 | “ |
| 213 Plain street | 4 | 1 year. |
| R246 Thurber avenue | 4 | 6 years. |
| R246 Thurber avenue | 5 | 2 “ |
| 109 Wadsworth street | 4 | 9 “ |

In the preceding paragraphs “return cases” have not been taken into account. By return cases is usually meant those cases which develop in a family after the return of a patient who has been removed to the hospital, and which are presumably due to the return. The consideration of these cases is important as throwing light on the duration of infectivity.

In 1909 there were 16 “return cases” of scarlet fever in 13 families caused by 13 “infecting cases” discharged from the hospital.

At 187 Allston Street the first case was taken sick February 14, went to the hospital February 15, returned April 23, and the second case was taken sick May 5.

At 4 Amy Street the first case was taken sick May 17, went to the hospital May 20, returned June 29, and the second case was taken sick July 10.

At 113 Arnold Street the first case was taken sick March 15, went to the hospital March 17, returned April 24, and the second case was taken sick May 2.

At 60 Benevolent Street the first case was taken sick October 18, went to the hospital October 19, returned December 10, and the second case was taken sick December 23.

At 44 Calla Street, the first case was taken sick June 24, went to the hospital June 25, returned August 10, and the second case was taken sick August 28.

At 12 Chalkstone Avenue the first case was taken sick January 21, went to the hospital January 23, returned March 31, and subsequent cases were taken sick on April 6, April 16, and April 17.

At 125 Elm Street the first case was taken sick October 21, went to the hospital October 24, returned December 13, and the second case was taken sick December 21.

At 24 Evergreen Street the first case was taken sick April 14, went to the hospital April 16, returned May 24th, and the second case was taken sick May 31.

At 225 Blackstone Street a child was taken sick with both scarlet fever and diphtheria Nov. 2, 1908, and went to the hospital the same day, and returned December 10. Another case of scarlet fever developed in the family Jan. 16, 1909.

At 286 Grove Street a child was taken sick with scarlet fever about January 26, but the disease was not recognized. On March 6th the case was removed to the hospital on account of cervical abscesses, and returned April 12th. Two other cases of scarlet fever developed in the family on April 18. There had been another case of scarlet fever in the same family taken sick about the same time which did not go to the hospital.

At 192 North Main Street cases of scarlet fever developed September 28th and 30, and were removed to the hospital

September 29 and October 2. Both returned November 4, and another case developed in the family November 18.

At 325 Willard Avenue the first case was taken sick May 25, went to the hospital May 29 and returned July 8. A second case developed July 10.

At 36 Winter Street the first case was taken sick September 12, went to the hospital September 15, returned October 22, and the second case was taken sick October 27.

Besides the above, there was one instance at 241 Blackstone Street where a second case developed in the family in the 8th month after the return of the first case from the hospital.

At 92 Winchester Street a case occurred in the second family in the house 5 months after the return of the first case from the hospital.

At 7 Penelope Place the first case was taken sick July 15th, went to the hospital July 18, returned August 3d, and a second case developed August 12. Meanwhile, there had been an unrecognized case in the family which remained at home. This was not reckoned an instance of return infection from the hospital.

At 16 Caswell Court a case developed in the second family in the house 41 days after the return of the first case from the hospital.

At 619 Charles Street a child went to the hospital with diphtheria on March 7 and returned March 27. The same child developed scarlet fever May 4th.

The preceding four cases are not reckoned return cases.

The average period of detention of the 13 infecting cases was 50.85 days. The shortest period was 38 days, and the longest 77 days. There was no desquamation in any of the infecting cases.

Of the 171 cases of scarlet fever discharged from the hospital 9 were desquamating, and it is not known that any cases developed from them.

During 1909 there were 3 families in which cases returning from the hospital presumably brought back diphtheria. Besides these, there was one instance in which the "return case" did not develop for over 5 months, which is beyond the limit of 2 months usually set for the reckoning of return cases. The 5 months' case was at 59 Steuben St. There was also at 257 Willard Avenue an alleged return case in the 9th month, but in this instance in neither the "infecting case" nor the "return case" were any diphtheria bacilli found, although numerous cultures were taken.

The following are brief notes of the three cases reckoned as return cases:

At 22 Huntington Avenue the first case was taken sick January 11, went to the hospital January 13, and was discharged February 21, after two successive negative cultures from throat and nose. The return case developed on February 26.

At the rear of 182 Veazie Street the first case was taken sick January 8, went to the hospital January 9 and returned February 14, after two successive negative cultures from throat and nose. The second case was taken sick on March 8.

At 266 Chalkstone Avenue the first case was taken sick February 5, went to the hospital February 6, and returned February 14, after five successive negative cultures from throat and nose. The second case was taken sick March 2.

The number of "infecting cases" discharged from the hospital since its opening is shown in the following. There is also shown the time from the beginning of the sickness that they remained in the hospital and the day of discharge on which the "return case" developed. If more than one return case developed only the first is reckoned. This interval between the return of the patient and the development of the return case is important as throwing light on the period of incubation, but subsequent cases in the family may perhaps develop from the first return case instead of from the infecting case. Instances in which cases develop in the family over two months after the return of a case from the hospital are not reckoned as return cases in these reports, as probably very few are really such cases and a time limit must necessarily be fixed at some point. In the table 4 cases of diphtheria and 1 of scarlet fever fall outside of this two months' limit.

One of the return cases of scarlet fever was not in the same family as the infecting case, and 4 of the diphtheria cases were not. Two of the diphtheria cases were caused by scarlet fever patients and 1 by a measles patient. In 1 instance the infecting scarlet fever case was only isolated 7 days, and in another only 14 days, as the hospital physician did not think the disease scarlet fever.

## TABLE XXXIII.

### INFECTING CASES DISCHARGED FROM HOSPITAL 1891–1909.

| Diphtheria. | | | | Scarlet Fever. | | | |
|---|---|---|---|---|---|---|---|
| Isolation of Infecting case from beginning of sickness. | Number of Cases. | Day of discharge on which return case developed. | Number of Cases. | Isolation of Infecting case from beginning of sickness. | Number of Cases. | Day of discharge on which return case developed. | Number of Cases. |
| 6 days....... | 1 | 1 day....... | 1 | 7 days...... | 1 | 2 days...... | 1 |
| 9 " ....... | 2 | 2 days...... | 1 | 17 " ...... | 1 | 3 " ...... | 5 |
| 13 " ....... | 2 | 3 " ...... | ...... | 28 " ...... | 1 | 4 " ...... | 3 |
| 14 " ....... | 4 | 4 " ...... | 2 | 30 " ...... | 1 | 5 " ...... | 4 |
| 15 " ....... | 1 | 6 " ...... | 7 | 31 " ...... | 1 | 6 " ...... | 4 |
| 16 " ...... | 1 | 7 " ...... | 2 | 35 " ...... | 3 | 7 " ...... | 5 |
| 17 " ....... | 1 | 10 " ...... | 2 | 36 " ...... | 1 | 8 " ...... | 6 |
| 18 " ....... | 2 | 11 " ...... | 1 | 37 " ...... | 1 | 9 " ...... | 4 |
| 19 " ....... | 1 | 12 " ...... | 3 | 38 " ...... | 5 | 10 " ...... | 1 |
| 21 " ....... | 3 | 13 " ...... | 2 | 39 " ...... | 2 | 12 " ...... | 1 |
| 22 " ...... | 1 | 15 " ...... | 1 | 40 " ...... | 5 | 13 " ...... | 3 |
| 24 " ...... | 2 | 17 " ...... | 1 | 41 " ...... | 4 | 14 " ...... | 2 |
| 25 " ....... | 2 | 18 " ...... | 1 | 44 " ...... | 1 | 15 " ...... | 1 |
| 26 " ....... | 1 | 22 " ...... | 2 | 45 " ...... | 1 | 16 " ...... | 1 |
| 28 " ....... | 4 | 23 " ...... | 2 | 46 " ...... | 2 | 17 " ...... | 1 |
| 32 " ....... | 1 | 24 " ...... | 1 | 48 " ...... | 3 | 19 " ...... | 2 |
| 34 " ....... | 1 | 25 " ...... | 1 | 49 " ...... | 2 | 20 " ...... | 1 |
| 37 " ....... | 1 | 27 " ...... | 2 | 51 " ...... | 1 | 23 " ...... | 2 |
| 42 " ....... | 1 | 37 " ...... | 1 | 52 " ...... | 1 | 38 " ...... | 1 |
| 47 " ....... | 1 | 3rd mo........ | 3 | 54 " ...... | 2 | 52 " ...... | 1 |
| 52 " ....... | 1 | 4th " ....... | 1 | 56 " ...... | 2 | 4th mo....... | 1 |
| 60 " ....... | 2 | | | 65 " ...... | 1 | | |
| 68 " ....... | 1 | | | 67 " ...... | 1 | | |
| | | | | 69 " ...... | 1 | | |
| | | | | 70 " ...... | 2 | | |
| | | | | 71 " ...... | 1 | | |
| | | | | 77 " ...... | 1 | | |
| | | | | 2 months .... | 1 | | |
| | | | | 138 days ....... | 1 | | |
| | 37 | | 37 | | 50 | | 50 |

## EXPENSES OF THE HEALTH DEPARTMENT.

The appropriation for the year ending September 30, 1909, was $72,711.10. The expenditures were $72,507.40 leaving a balance of $203.70 to be turned into the general fund.

The expenses in detail for the last five fiscal years ending Sept. 30 of each year, were as follows :

| | 1905. | 1906. | 1907. | 1908. | 1909. |
|---|---|---|---|---|---|
| Salary of Superintendent of Health | $2,000 00 | $2,000 00 | $2,000 00 | $2,000 00 | $2,000 00 |
| Collection and removal of garbage. | 27,590 04 | 27,590 04 | 27,590 04 | 27,590 04 | 27,590 04 |
| Salary of Sanitary Inspector....... | 1,200 00 | 1,451 00 | 1,278 86 | 1,200 00 | 1,374 00 |
| Smallpox expenses................ | 232 31 | 456 10 | 51 85 | 13 85 | 10 00 |
| Board of communicable diseases at Rhode Island Hospital...... ... | 14,663 86 | 10,051 14 | 21,779 23 | 22,321 58 | 22,030 79 |
| Miscellaneous expenses of communicable diseases............ | 34 57 | 93 94 | 3,548 86 | 33 10 | 172 10 |
| Antitoxin.............................. | .......... | .......... | .......... | .......... | 305 90 |
| Vaccination........................ | 795 54 | 1,004 15 | 992 91 | 1,169 82 | 1,017 22 |
| Medical Inspectors................ | 1,500 00 | 1,542 00 | 1,997 50 | 2,154 00 | 2,154 00 |
| Disinfection ....................... | 1,065 01 | 1,016 10 | 1,102 45 | 1,049 63 | 954 09 |
| Quarantine......................... | 58 00 | 76 00 | 56 00 | 46 00 | 34 00 |
| Laboratory......................... | 381 80 | 504 86 | 488 01 | 596 43 | 480 11 |
| Salary of School Inspectors........ | 1,000 00 | 1,300 00 | 1,500 00 | 1,500 00 | 1,750 00 |
| School Nurse...................... | .......... | .......... | .......... | .......... | 319 00 |
| Other School Inspection expense.. | 24 42 | 17 61 | 41 61 | 20 25 | 22 74 |
| Collecting returns of births, marriages, and deaths............. | 2,712 30 | 2,702 65 | 2,889 95 | 3,077 75 | 2,950 25 |
| Recording births, marriages and deaths............................ | 1,982 20 | 2,521 00 | 2,499 80 | 3,150 20 | 2,700 60 |
| Other registration expenses........ | 40 76 | 32 67 | 25 08 | 35 60 | 37 52 |
| Rabies, laboratory expenses........ | .......... | 855 87 | 703 91 | 239 70 | 120 50 |
| Rabies, treatment...... ........... | .......... | | 3,320 60 | 428 64 | 180 30 |
| Horses, wagons, buggies .......... | 1,575 54 | 1,885 26 | 1,302 04 | 1,770 10 | 2,242 67 |
| Inspector of Provisions............ | 1,200 00 | 1,200 00 | 1,200 00 | 1,201 65 | 1,211 39 |
| Clerk Hire............ ............. | 723 00 | 810 00 | 996 00 | 1,103 65 | 1,188 85 |
| Telephones......................... | 196 74 | 188 61 | 178 90 | 170 93 | 166 50 |
| Printing.............. ............ | 91 61 | 346 95 | 272 78 | 468 79 | 571 84 |
| Postage ........................... | 92 40 | 320 30 | 309 88 | 353 64 | 284 60 |
| Office Supplies.............. ....... | 270 83 | 417 12 | 210 75 | 317 88 | 434 80 |
| Binding....... .. .................. | 30 81 | 47 98 | 57 34 | 73 88 | 117 59 |
| Car fare........................... | 80 00 | 85 00 | 50 00 | 79 80 | 84 00 |
| Miscellaneous expenses.... ....... | 948 41 | 585 76 | 259 28 | 49 97 | 2 00 |
| Total ............. .......... | $60,490 15 | $59,102 11 | $76,703 63 | $72,216 88 | $72,507 40 |

The following is my estimate of the expenses of the Health Department for the fiscal year ending September 30, 1911:

| | |
|---|---|
| Salary of Superintendent of Health | $2,000 00 |
| Removal of swill | 27,590 04 |
| Sanitary inspection | 2,000 00 |
| Vaccination | 1,200 00 |
| Medical inspection | 3,000 00 |
| Disinfection | 1,000 00 |
| Contagious diseases, miscellaneous expenses | 500 00 |
| School inspection | 3,000 00 |
| Registration | 6,000 00 |
| Horses, buggies, etc. | 2,200 00 |
| Inspection of provisions | 1,200 00 |
| Clerk hire | 1,200 00 |
| Telephone | 166 50 |
| Printing | 600 00 |
| Postage | 300 00 |
| Office supplies | 500 00 |
| Carfare | 100 00 |
| Binding | 200 00 |
| Rabies, laboratory, etc. | 2,000 00 |
| Miscellaneous | 1,243 46 |
| Total | $56,000 00 |

Respectfully submitted,

CHARLES V. CHAPIN,

*Superintendent of Health.*

UNIVERSITY OF ILLINOIS-URBANA
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